TECHNOLOGY DEPT.

ROADS AND STREETS

JANUARY 1945

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DETROIT

More Timken Bearings are used in American construction machinery than any other bearings.

U. S. Signal Corps Photograph, showing a Caterpillar Tractor and La Plant-Choate R-71 Trailbuilder at work.

Blazing the long, long trail to VICTORY

To American construction equipment and the men who make and operate it, must go a large share of the credit for the spectacular progress made by our fighting forces on the battle fronts of the world. May they soon achieve final victory and return to the ways of peace.

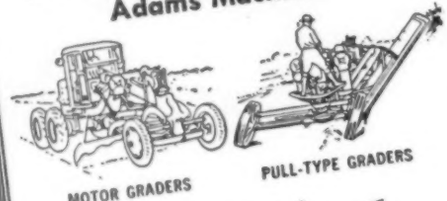
THE TIMKEN ROLLER BEARING COMPANY, CANTON 6, OHIO

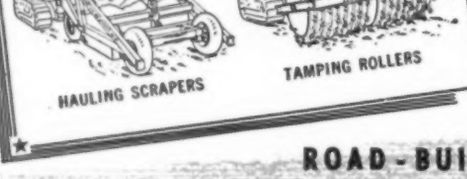
TIMKEN
TRADE-MARK REG. U. S. PAT. OFF.
TAPERED ROLLER BEARINGS

FROM DITCH CUTS TO BANK CUTS

Without Mechanical Adjustments

Ask Your Dealer About These Adams Machines





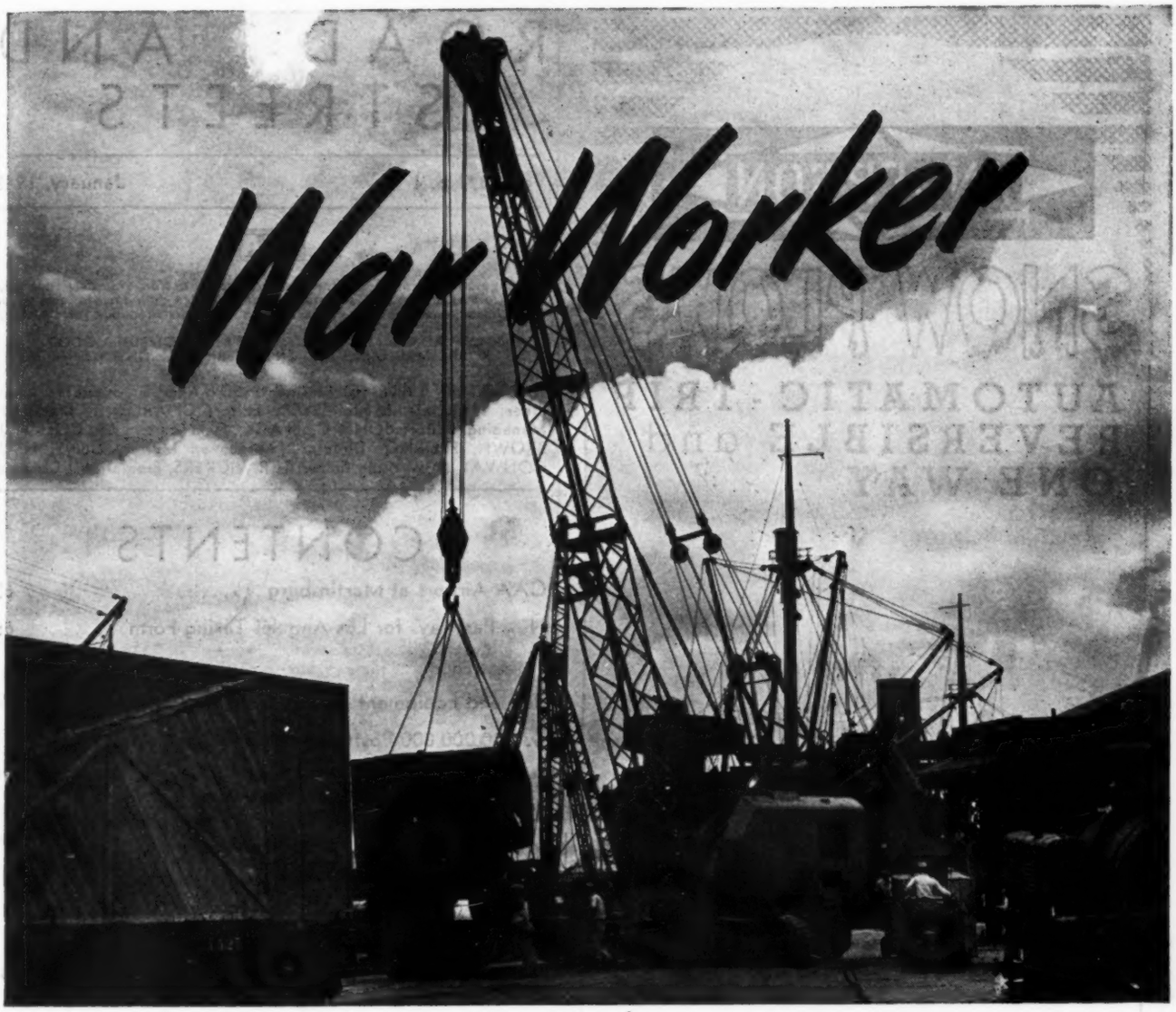
MANY road grading jobs call for frequent alternating between ditch cuts and bank cuts—particularly where several bank cuts are necessary.... With Adams motor graders the operator can alternate between deep ditch cuts and high bank cuts, as pictured above, without shifting the blade on the circle or adjusting the length of blade lift links. Simply by using his operating levers, he goes from one position to the other in less than a minute—almost in the time it takes the outfit to turn around.

This is but one time-saving reason why your next motor grader should be an Adams. See your local Adams dealer now about the availability of new machines.

J. D. ADAMS COMPANY
INDIANAPOLIS, INDIANA

ADAMS

ROAD-BUILDING AND EARTH-MOVING EQUIPMENT



Not all war workers carry lunch pails and wear badges.

Plenty of them, like the crane in the picture, will never punch a time clock nor boss an assembly line. But they're war workers, just the same.

We're not going to say the obvious thing about Bethlehem Wire Rope, and the way it's helping so many vital machines to keep moving these days. We're simply going to mention that tons and tons of it are giving service all over the world, and that our people are working day and night at the factory, turning out still more Bethlehem Wire Rope for Government and civilian use.

We'd like to add, too, that Bethlehem rope has been handling some jobs that are 'way off the beaten path. (There's a landing-craft application that's a honey, but details can't be published till after the war.) All this experience is helping us accumulate facts that mean better wire rope. It's helping us make wire rope that will do old jobs better . . . new jobs efficiently.

Remember that, when you go to rerig your machines. Bethlehem has the background, the materials, the facilities, and the experience. All these ingredients, mixed together and cooked skillfully, mean good wire rope . . . as fine as the market affords. It will pay you to look for the Bethlehem trademark.

When you think WIRE ROPE
. . . think BETHLEHEM

ANDERSON

SNOW PLOWS

AUTOMATIC-TRIP
REVERSIBLE and
ONE WAY

SHOWN ABOVE—ONE way tripping snow plow for heavy duty trucks. Also made in proportional size and strengths for light trucks.

Suitable for State Highways, City Streets, Airports, Parks, and Industrial plant plowing, they are in use from Alaska to the Carolinas —in all parts of the country's snow belt.

You can depend on an Anderson plow.

LARGE STOCKS
QUICK SHIPMENTS

ANDERSON ENGINEERING CO.
Engineers & Manufacturers
21 Charles St.
Cambridge 41, Mass.

ROADS AND STREETS

Vol. 88, No. 1 January, 1945

CCA

A magazine devoted to the design, construction, maintenance and operation of highways, streets, bridges, bridge foundations and grade separations, and to the construction and maintenance of airports.

WITH ROADS AND STREETS HAVE BEEN COMBINED GOOD ROADS MAGAZINE AND ENGINEERING & CONTRACTING

HALBERT P. GILLETTE, President; EDWARD S. GILLETTE, Publisher; HAROLD J. McKEEVER, Editor; CHARLES T. MURRAY, Managing Editor; JOHN C. BLACK, Field Editor; LT. COL. V. J. BROWN, Publishing Director (Absent on Military Duty); H. J. CONWAY, Advertising Editor; L. R. VICKERS, Promotional Director.

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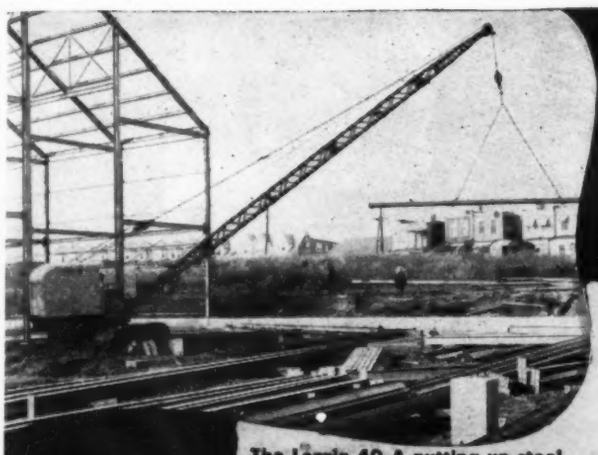
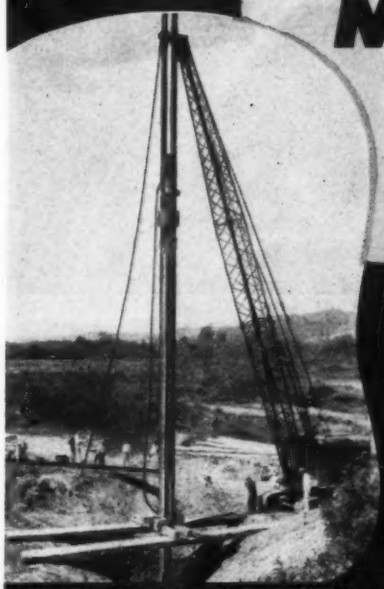


The Lorain 40-A putting up steel

The Self-Propelled Lorain handling yard stock

For Bigger Profits MATCH THE MACHINE TO THE JOB



A Lorain 80 putting down 50' bridge piling

Two Moto-Cranes place a huge filter tank

Whether it's driving piles, putting up steel, juggling massive machinery, slinging cement, handling loose materials of any one of a hundred other crane jobs, there's a Lorain crane with proper mounting, boom and equipment to fit the job to a "T". These wide choices show you how it's possible to pick the right Lorain for the job . . . for greatest efficiency and most profit:

MANY MODELS AND MOUNTINGS

Large crawler cranes up to 31 ton capacity. Small crawler cranes up to 10½ ton capacity. Rubber tired Moto-Cranes, 15 and 20 ton capacity (*20 ton is 6-wheel drive*).

Rubber tired self-propelled crane, 20 ton capacity.

14 DIFFERENT WAYS TO USE A LORAIN CRANE

Clamshell buckets, dragline buckets, orange peel buckets, skips, grabs, concrete buckets, slings, grapples, skull crackers, hook blocks, tongs, special hooks, magnets, LCL containers.

COMPLETE RANGE OF BOOMS

All-welded, light in weight, strong. Center sections easily inserted to provide any length of boom required. Straight tip extensions, gooseneck tip extensions, and so on.

Next time you have a crane job, let a Lorain distributor show you the perfect match for it . . . and the surest way to greater profits on your next contract.

Reg. Trade Mark

thew-Lorain

THE THEW SHOVEL CO.
Lorain, Ohio

CRANES · SHOVELS · DRAGLINES · MOTO-CRANES

STOUT STEEL MUSCLES
for the Merchant Marine

The rigging for a typical cargo ship requires over 11,000 feet of wire rope, ranging in size from ¼ inch to 2¼ inches, and weighing over 10 tons. Scores of shipyards are building such ships—and using plenty of tough, dependable Wickwire Rope.

Oil fields, mines, logging camps, construction crews—and our fighting men abroad—also depend upon the stout steel muscles of Wickwire Wire Rope to do their heavy hoisting and hauling jobs. That's why—even with more equipment and working at full capacity 24 hours a day—we cannot keep up with the great demands for Wickwire Rope.

Since wire rope is harder to get, each length must be made to last longer. WISSCOLAY *Pre*formed Wire Rope, manufactured by Wickwire Spencer, not only lasts longer, but it's kink-resistant—easier to cut, splice and install—safer to handle.

If you have a wire rope problem our wire rope engineers will be happy to be of service. Call or write our nearest branch office or Wickwire Spencer Steel Company, 500 Fifth Avenue, New York 18, N. Y.

VALUABLE GUIDE FOR ALL ROPE USERS

Thousands of copies of "Know Your Ropes" have been sent to men in industry and the Services. Packed with ideas for making wire rope last longer this 82 page book contains 48 wire rope life-savers; 78 "right and wrong" illustrations, and 20 diagrams, tables, graphs, charts.

SEND FOR YOUR FREE COPY

Send your wire rope questions to:

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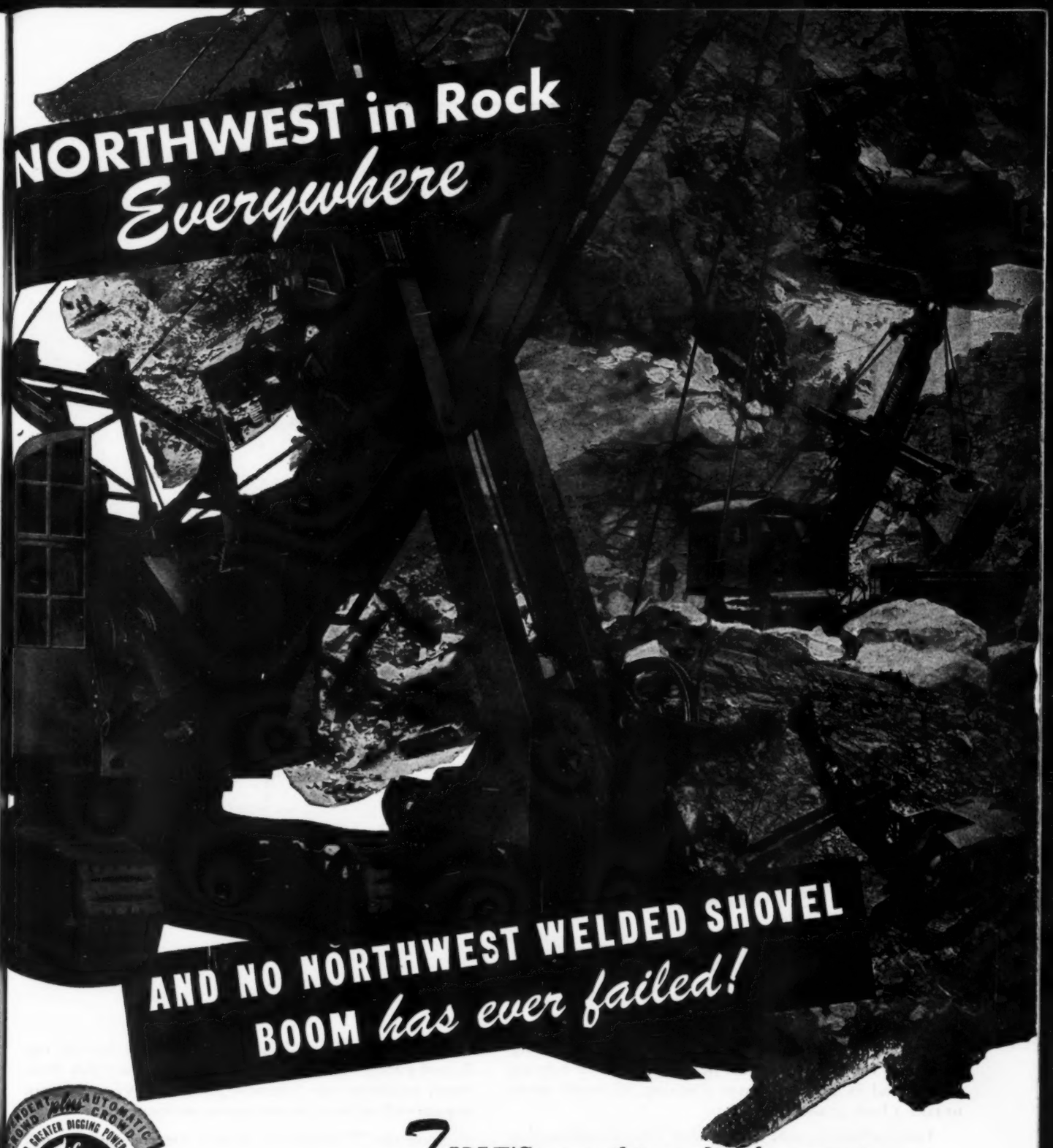


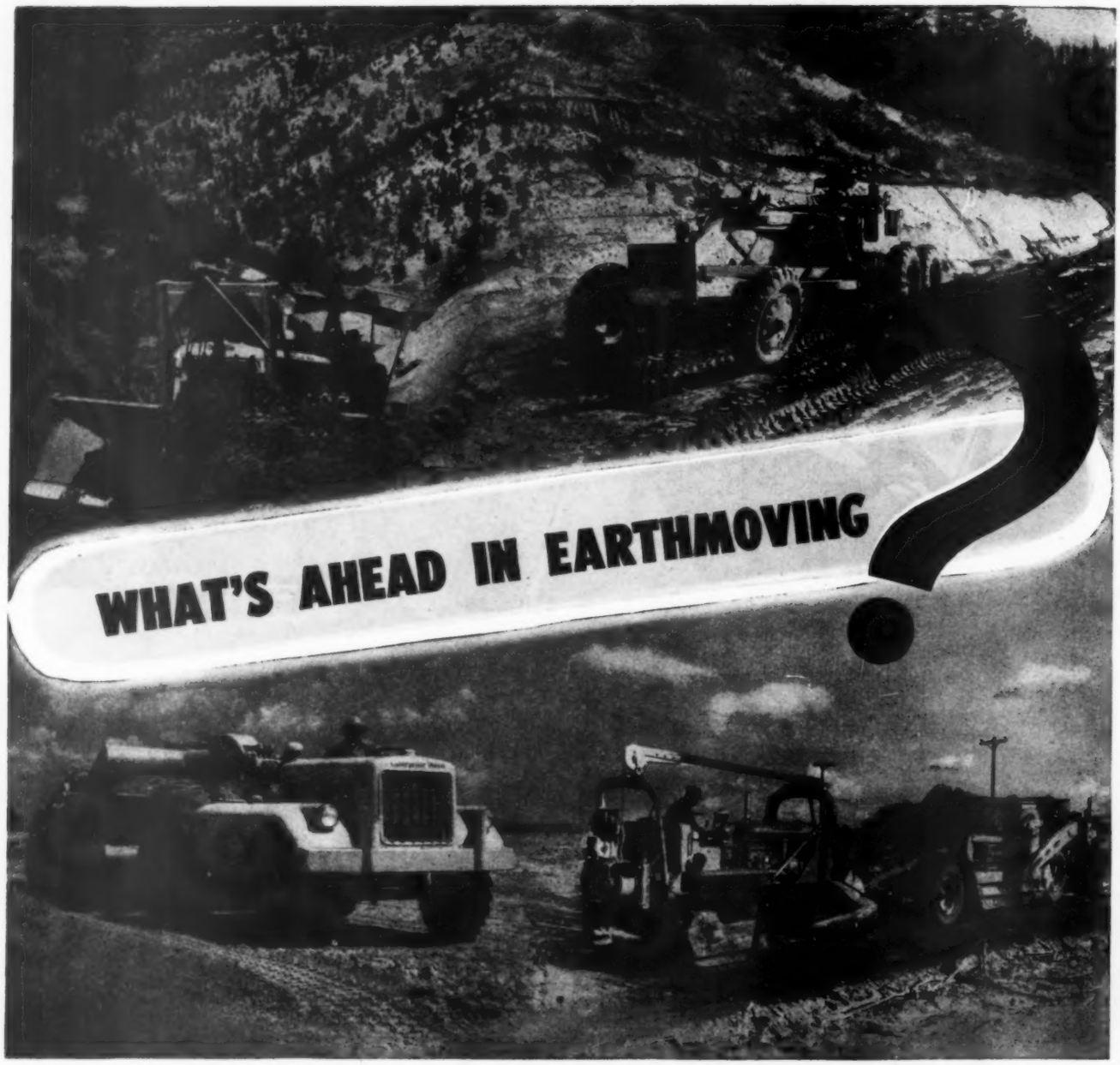
INDEPENDENT CROWD plus AUTOMATIC CROWD
FOR GREATER DIGGING POWER
The DUAL CROWD

and when you have a real Rock Shovel you won't have to worry about output in dirt

THAT'S something else for you to think about in your post war planning! Better built—cheaper to operate—a Real Rock Shovel and if you have a Real Rock Shovel you'll have high output in any kind of digging.

NORTHWEST ENGINEERING COMPANY
1732 Steger Bldg. • 28 E. Jackson Blvd., Chicago 4, Illinois

NORTHWEST



EARTHMOVERS are going to be busy. You are getting ready now for the big jobs that lie ahead when the fighting stops. And in any long-range planning, it's worth while to take a look at some records:

Long before the war, "Caterpillar" Diesel earthmoving equipment had won its reputation for stamina, economy and dependability. You know the number of "Caterpillar" *firsts* in the field — from the original track-type tractor and the introduction of Diesel power to the operating ease of finger-tip control. You know, too, that sound engineering and thorough testing have always *proved* new "Caterpillar" developments before they appeared on the market. "Caterpillar" customers have no orphan machines.

The thousands of "Caterpillar" Diesels serving our Armed Forces in this war offer added evidence that these sturdy machines rate foremost preference when you put in your orders for new contracting equipment.

Soon the "Caterpillar" Diesels for civilian uses will again be rolling off the production lines. Through "Caterpillar" quality, Diesel economy, correct design, all types of matched equipment to fit the job — and through top-notch dealer parts and mechanical services that help keep the job rolling — "Caterpillar" means *lowest costs on earth.*

CATERPILLAR TRACTOR CO. • PEORIA, ILLINOIS

CATERPILLAR DIESEL

REG. U.S. PAT. OFF.

ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT

Another

MARION *Achievement*

A CRANE THAT HAS EVERYTHING!

ACCURACY in spotting loads.

SMOOTH acceleration.

STABILITY with long reach.

MANEUVERABILITY in close quarters.

LIVE BOOM HOIST.

READILY CONVERTIBLE to dragline or clamshell service.

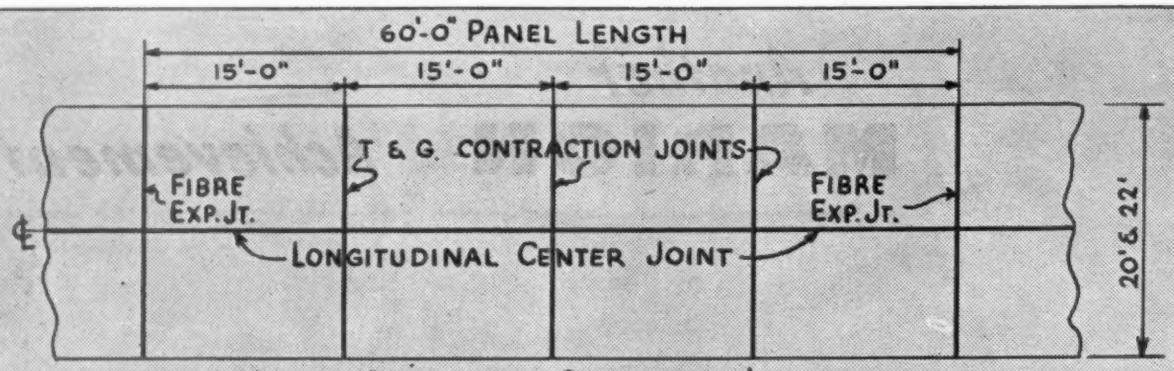
What are your material handling problems? Let's discuss them.

THE MARION STEAM SHOVEL COMPANY • MARION, OHIO

Modernize with **MARION**

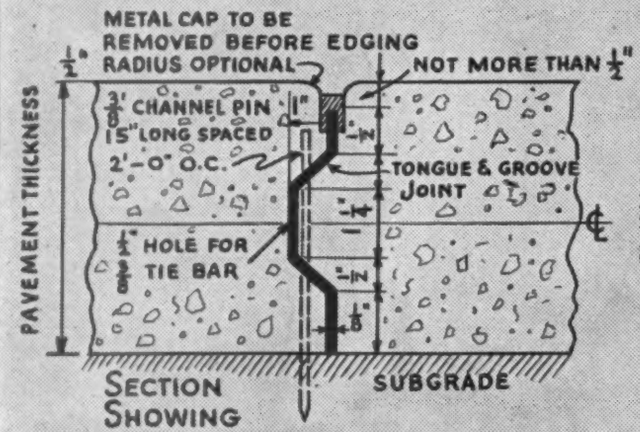
SHOVELS • DRAGLINES • CRANES • CLAMSHELLS • WALKERS • PULL-SHOVELS

COAL LOADERS • STRIPPING SHOVELS • GAS • DIESEL • ELECTRIC (From ¾ cu. yd. to 35 cu. yds.)

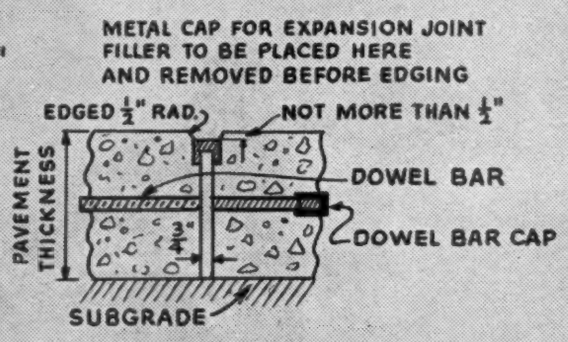


PLAN OF PAVEMENT SHOWING JOINTS

NOTE:— LENGTH OF PANEL BETWEEN EXPANSION JOINTS OPTIONAL BUT CONTRACTIONS TO REMAIN 15' CENTERS


METAL CAP TO BE REMOVED BEFORE EDGING
RADIUS OPTIONAL
NOT MORE THAN 1/2"
3/8" CHANNEL PIN 15" LONG SPACED 2'-0" O.C.
TONGUE & GROOVE JOINT
1/2" HOLE FOR TIE BAR
PAVEMENT THICKNESS
SUBGRADE

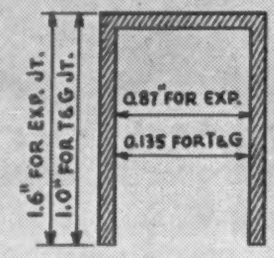
SECTION SHOWING
TONGUE & GROOVE LONGITUDINAL CENTER JOINT & CONTRACTION JOINT


METAL CAP FOR EXPANSION JOINT FILLER TO BE PLACED HERE AND REMOVED BEFORE EDGING
EDGED 1/2" RAD.
NOT MORE THAN 1/2"
PAVEMENT THICKNESS
DOWEL BAR
DOWEL BAR CAP
SUBGRADE

SECTION SHOWING
FIBRE TRANSVERSE EXPANSION JOINT

NOTE:- ALL FIBRE EXPANSION JOINTS SHALL CONFORM TO AASHO SPEC. M-59-42

NOTE:- TONGUE & GROOVE JOINTS FOR LONGITUDINAL & CONTRACTION JOINTS SHALL BE ASPHALT MASTIC BOARD AS MANUFACTURED BY KEYSTONE ASPHALT PRODUCTS CO. OR EQUAL AS APPROVED (STEEL CENTER STRIP MAY BE MENTIONED IN SPECS. IF ENGINEERING AUTHORITY DEEMS NECESSARY



CAP FOR ALL JOINTS
12 GA. STEEL

PLAN OF PAVEMENT SHOWING JOINT LAYOUT
SUGGESTION NO. 1
KEYSTONE ASPHALT PRODUCTS CO. CHICAGO, ILL.
NOV. 9, 44. T. R. J.

"One Stop" SERVICE

For convenience, economy and assurance that everything you need will be on the job when you want it, it will pay you to let Keystone furnish all your requirements . . .

KEYSTONE ASPHALT MASTIC BOARD CENTER STRIP
KEYSTONE MASTIC BOARD DUMMY JOINT
KEYSTONE ASPHALT EXPANSION JOINTS
KEYSTONE FIBRE EXPANSION JOINTS
KEYSTONE CORK EXPANSION JOINTS
INSTALLING CAP PLATES FOR CENTER STRIP
STAKE PINS FOR CENTER STRIP
INSTALLING CHANNELS FOR DUMMY JOINT
KAPCO CONCRETE CURING COMPOUND
JOINT SEALING COMPOUNDS AND CRACK FILLERS

KEYSTONE ASPHALT PRODUCTS COMPANY
A Division of American-Marietta Company
43 East Ohio Street, Chicago 11, Illinois • Factory: Chicago Heights, Illinois

GALION

The GALION IRON WORKS & MFG. CO.

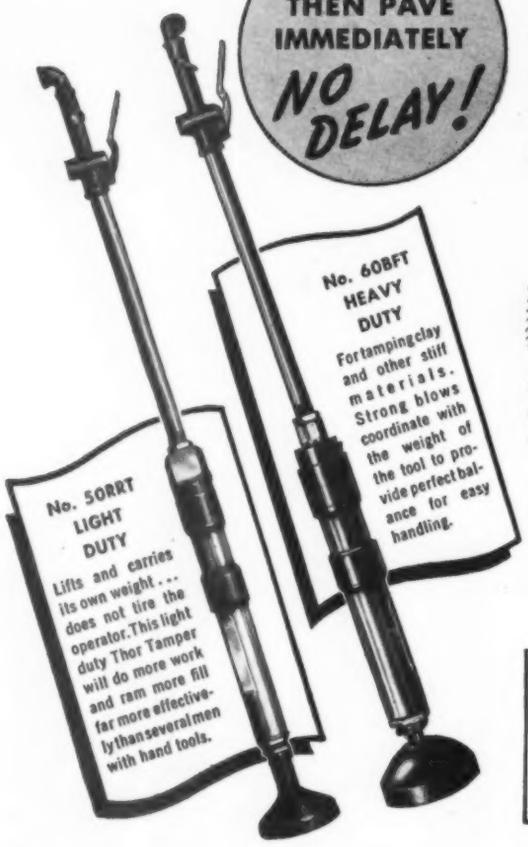
Main Office and Works: Galion, Ohio

MAN! THIS TAMPER SURE HANDLES EASY AND RAMS HARD!

Thor BACKFILL TAMPERS

DO THE JOB QUICKER, BETTER... SAVE MONEY AND MAN HOURS!

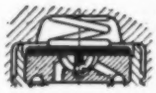
TAMP... THEN PAVE IMMEDIATELY NO DELAY!



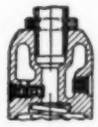
No. 50RRT LIGHT DUTY
Lifts and carries its own weight... does not tire the operator. This light duty Thor Tamper will do more work and ram more fill far more effectively than several men with hand tools.

No. 60BFT HEAVY DUTY
For tamping clay and other stiff materials. Strong blows coordinate with the weight of the tool to provide perfect balance for easy handling.

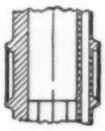
You can tamp . . . then pave *at once* when you use smooth running, rapid, powerful-hitting Thor Backfill Tampers. These Thor Tampers *ram dirt hard*—put it firmly into place *to stay!* No coming back on a job again and again to backfill, you can lay your paving immediately!



AIR ECONOMY
Simple, efficient Thor Rocker Valve is designed to utilize every ounce of air that enters the machine. Gives long service with minimum wear. Tampers develop powerful blow under 90 pounds air pressure; will operate efficiently on 65 pounds.

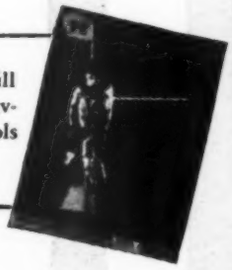


POSITIVE LUBRICATION
Automatic lubrication system keeps oil distributed throughout the tools constantly. Keeps the valve block spring functioning perfectly. Reservoir holds sufficient oil for a full day's running.



EXHAUST DEFLECTOR
Easily adjustable, simple to operate. Can be turned in any direction to blow the air down and away from the operator's legs.

FOR MORE FACTS about these *sure-hitting* Thor Backfill Tampers and the complete line of associated Thor Paving Breakers, Rock Drills, and other contractors' tools write today for Catalog 42-A.



SPECIFICATIONS

	No. 50RRT	No. 60BFT
Bore of Cylinder	1¼"	1½"
Length Overall	48¼"	49"
Weight	22 lbs.	29 lbs.
Equipment	5" Dia. Rd. Mall. Iron Butt	6" Dia. Rd. Mall. Iron Butt

Thor *Portable Pneumatic and Electric Tools*

INDEPENDENT PNEUMATIC TOOL COMPANY

600 W. JACKSON BOULEVARD, CHICAGO 6, ILL.

Branches in Principal Cities

HEAVY WET SNOW

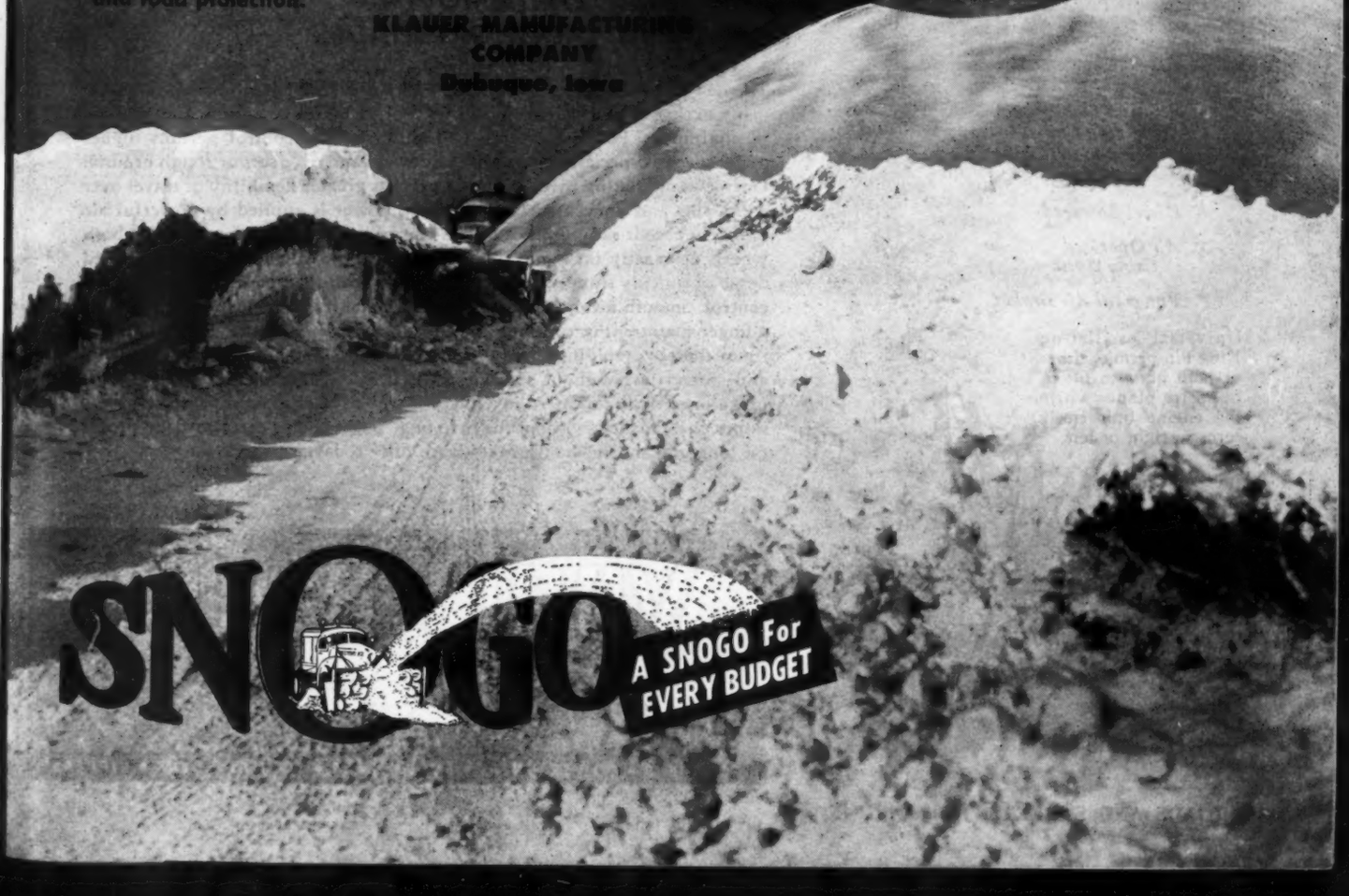
...removed by SNOGO

When snow falls heavy and wet, packing down into an ice-solid mass—it takes SNOGO to handle the situation effectively, by throwing the heavy snow well off the road.

Modern communities, geared to the constant use of motor highways, depend upon their highway officials to keep these roads clear. Today the business of 48,000 communities is entirely dependent on motor transportation. In these cities snow clearance is imperative—the school busses must get through—trucking must not be stalled—there should be no loss of business for the merchants in the towns. It is a big responsibility, this matter of fighting the elements, but with SNOGO equipment, highway officials can and do clear the light snows and the blizzards alike from the path of modern traffic—the modern way.

SNOGO throws snow off the road, cutting cleanly and evenly through snow banks in a way no V-plow can. No banks build up to narrow the traffic lanes—to later melt onto the road; no blanket of snow remains to thaw and freeze into dangerous ruts. Check into what SNOGO can do to give you better winter snow clearance and road protection.

KLAUER MANUFACTURING COMPANY
Dubuque, Iowa



YOU'LL MOVE MORE EARTH FASTER .. WITH THE NEW WOOLDRIDGE

Features that Spell PERFORMANCE

- ★ *Positive-Two-Wheel Steering Control*
- ★ *Universal Oscillating Pivot-Coupling*
- ★ *Diesel Powered*
- ★ *Air Operated Cable Hoist*
- ★ *Powerful Air Brakes*

Universal oscillating King Pin permits either or both units to tilt in opposite planes while the engine unit freely turns to right or left.

HIGHSPEED EARTHMOVING ON LONG OR SHORT HAULS

The new Wooldridge self-propelled *TERRA-COBRA* Earthmover embodies many exclusive and patented features, not to be found in any similar type of equipment. Positive *2-wheel* hydraulic steering control permits higher travel speeds, especially on narrow causeways and over soft or rough ground. Universal oscillating pivot-coupling permits greater flexibility of travel over rocks, ruts and uneven surfaces. Braking power is applied by powerful air. brakes, where it should be . . . on the rear of the scraper and equally on both wheels at exactly the same time. Heavy fast moving loads can be slowed down or quickly stopped in a short distance with the operator always in full control. Smooth air-operated cable hoist instantly responds to the touch of a finger maintaining constant and uniformly even pressure on cables at all times thereby avoiding "jerky" starts or stops. Terra-Cobras load quickly and spread fast without slackening their pace. Surplus rim pull permits operator to reach top speed in a hurry as well as to climb comparatively steep slopes, fully loaded, without the help of a "pusher." For extra yardage profits on long and shorter hauls, investigate fully today.

WOOLDRIDGE
EARTHMOVING EQUIPMENT
SCRAPERS • POWER UNITS • BULLDOZERS • TRAILBUILDERS • RIPPERS

TERRA COBRA

SELF-PROPELLED — HIGH SPEED EARTHMOVERS

SPEEDS UP TO 21 M.P.H.

The new Terra-Cobra operating on four speeds forward rapidly accelerates to speeds up to 21 M. P. H. in a short distance. In reverse gear the Terra-Cobra operates at a maximum speed of 3.2 M. P. H. and 13,000 lbs. rim pull.

DIESEL POWERED

Powerful heavy duty 150 H. P. diesel engine propels the Terra-Cobra. Special mounting of engine in chassis facilitates rapid servicing or removal.

POSITIVE TWO-WHEEL STEERING ELIMINATES "JACKNIFING"

In the Terra-Cobra there are no steering clutches to "fight"—nor individual brakes to "humor" or grab. Steering is controlled by simply turning a steering bar. The front drive wheels turn together, under power. Regardless of speed, load or condition of ground surface the Terra-Cobra maintains a fixed direction of travel under the complete and effortless control of the operator. As there is never any possibility of *"jacknifing"* there's no need to slacken speed when traveling, spreading, turning or passing.

Get the full story on the new Wooldridge TERRA-COBRA. See how it will further speed-up your earthmoving operations and vastly increase safety.

WRITE TODAY FOR FULLY ILLUSTRATED BULLETIN NO. TA-425

WOOLDRIDGE MANUFACTURING COMPANY SUNNYVALE, CALIF.

TRUCK SERVICE MEN

who know what's expected of them–

INTERNATIONAL
New Trucks: The government has authorized the manufacture of a limited quantity of trucks for essential civilian hauling. International is building them in medium-duty and heavy-duty sizes. See your International Dealer or Branch for valuable help in making out application.

What's most important about truck service today?

Isn't it this: That the men who provide the service know what's expected of them . . . know that somehow they've got to keep overage trucks at work, hauling the million-and-one things a victory-bound nation needs?

Every day these men fix old trucks long overdue at the scrap heap—trucks that almost say, "I defy you to keep me hauling at a reasonable operating cost." The service men don't scare. Their attitude seems to be: "You can't bluff me, old timer, I'll keep you humping." And they do.

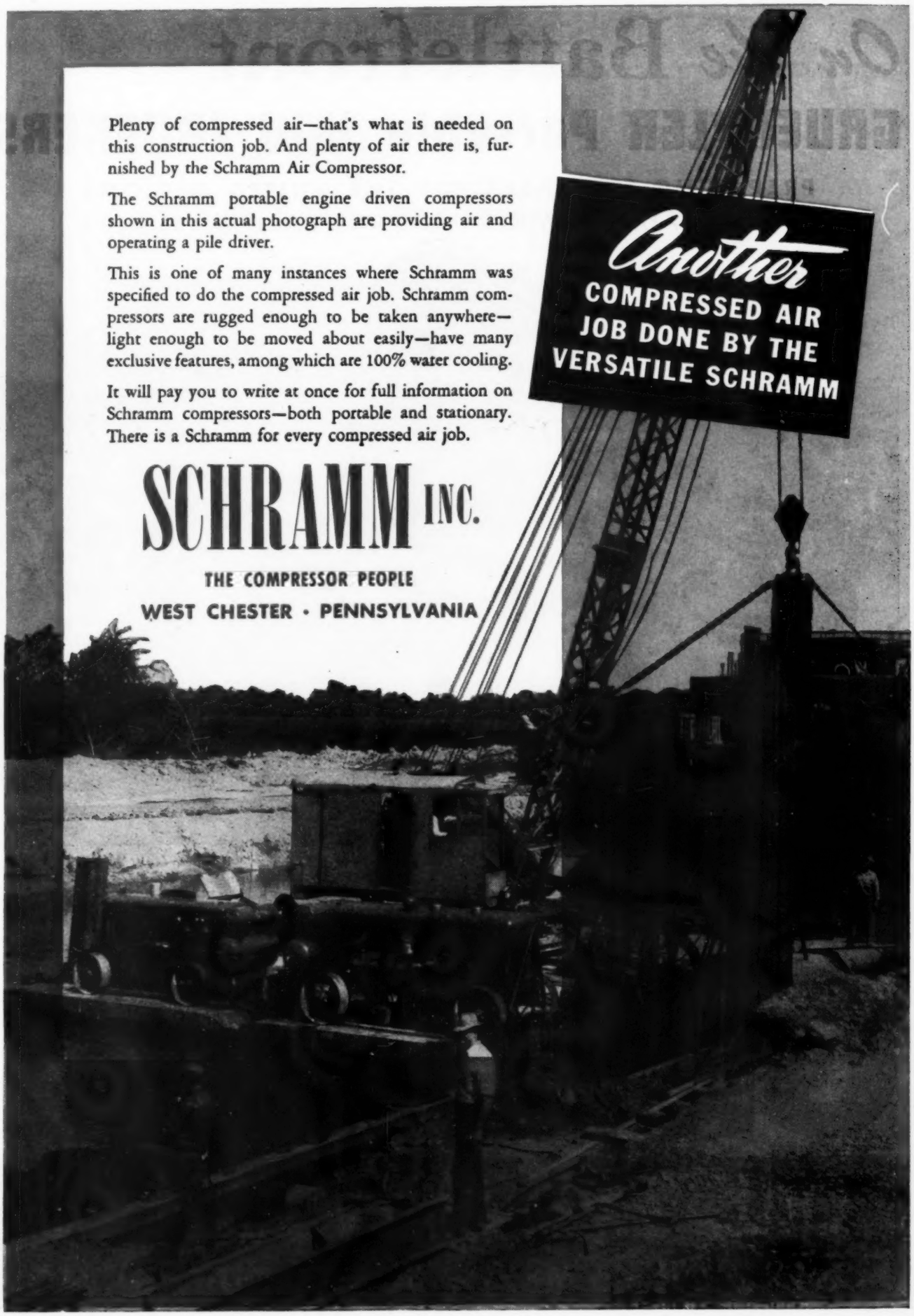
The service men at International Truck Branches, the nation's largest company-owned truck-service organization, and the service men who work for more than 5,000 International Truck Dealers aren't supermen. Sure, they have top tools, equipment and experience, and genuine International Parts. But they also know what's expected of them—know that unless they keep old trucks rolling, some of the things a victory-bound nation needs won't get there.

These men get no honors. They simply do what is needful—keep overage trucks at work when we'd all suffer seriously if the old trucks failed to perform.

INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue
Chicago 1, Illinois

HARVESTER

INTERNATIONAL *Trucks*



Plenty of compressed air—that's what is needed on this construction job. And plenty of air there is, furnished by the Schramm Air Compressor.

The Schramm portable engine driven compressors shown in this actual photograph are providing air and operating a pile driver.

This is one of many instances where Schramm was specified to do the compressed air job. Schramm compressors are rugged enough to be taken anywhere—light enough to be moved about easily—have many exclusive features, among which are 100% water cooling.

It will pay you to write at once for full information on Schramm compressors—both portable and stationary. There is a Schramm for every compressed air job.

SCHRAMM INC.

THE COMPRESSOR PEOPLE

WEST CHESTER · PENNSYLVANIA

On the Battlefront

GRUENDLER Portable JAW CRUSHERS

PREPARING THE BASES FOR THE UNITED NATIONS IN CHINA, INDIA, AFRICA AND THE PACIFIC ISLANDS

Forward Base being constructed with crushed stone and gravel for the B-29 Super Fortresses.

These units must be sturdy, rugged and easy to operate with a minimum of maintenace. You will find these qualities coupled with top performance in every Gruendler Crusher.

"Let GRUENDLER'S wartime efficiency insure your peace time prosperity"

GRUENDLER

CRUSHER *and* PULVERIZER CO.

2915-17 North Market St., ST. LOUIS (6), MO.

The Truck With a

$50,000,000.00 ENDORSEMENT

FWD's MODEL HAR

A truly great truck — the FWD Model HAR—a truck that in just four years has won the endorsement of motor truck users to a total of $50,000,000 in purchases of this single model—a truck that has achieved the phenomenal record of $50,000,000 in manufacturing experience in the comparatively brief span of 48 months.

Rated at 20,000 lbs. gross, the Model HAR embodies the highest development of the four-wheel-drive principle, pioneered and sponsored by FWD since 1910. Truck operators know that the true four-wheel-drive principle as applied in FWD's gives these trucks a basic mechanical advantage—qualifies them to get through regardless of road or weather—to go with greater safety — to perform year after year at lowest cost per ton mile — to conserve war-precious gas-oil-tires-replacements. When the call is for rugged, dependable trucks to provide vitally important motor transport, your confidence is well placed in FWD's.

THE FOUR WHEEL DRIVE AUTO CO.
Clintonville, Wisconsin
Canadian Factory: KITCHENER, ONT.

DETROIT PUBLIC LIBRARY

FOUR OF A KIND

Here is a power unit made up of four General Motors Series 71 6-cylinder Diesel engines driving a single shaft. The unit may be operated on one or more of the engines, as required.

It's called the "Quad," and two of them power each of the famous LCI landing boats. Quads save space and weight so more troops, equipment and fuel can be carried.

Half a "Quad"—two 6-71 engines mounted side by side—is a "twin," and these power Army tanks and tank destroyers.

Here is economical power for many postwar uses—power at less than 15 pounds per horsepower—power for applications where space and weight are at a premium.

All kinds of construction jobs lie ahead. And the answer to the dependable, low-cost power that will be needed is GM Diesel engines. These dependable, easy-on-the-fuel engines have proved themselves both in war and peace in all kinds of construction equipment.

KEEP AMERICA STRONG
BUY MORE WAR BONDS

GM
GENERAL MOTORS
DIESEL POWER

ENGINES . . 15 to 250 H. P. . . DETROIT DIESEL ENGINE DIVISION, Detroit 23, Mich.

ENGINES . . 150 to 2000 H. P. . . CLEVELAND DIESEL ENGINE DIVISION, Cleveland 11, Ohio

LOCOMOTIVES . . . . . ELECTRO-MOTIVE DIVISION, La Grange, Ill.

PORUS-KROME

a fish story..but true

Part of New England Fleet at Boston Fish Pier

80% of the New England fishing fleet boats have Lister-Blackstone auxiliary Diesel engines. This rugged engine is made still more reliable by having PORUS-KROME liners in its cylinders . . . a standard specification for every Lister-Blackstone engine.

PORUS-KROME resists both corrosion and abrasion and multiplies cylinder life from 4 to 20 times. Its porosity assures better lubrication, too. These characteristics are especially needed where the engines "run cold" as they do in fishing boats . . . and in other engines, too, which are used in cold weather.

Whether you build engines or use them, be sure that PORUS-KROME is on the cylinder walls. Write for full information.

PORUS - KROME

Good for the Life of your Engines

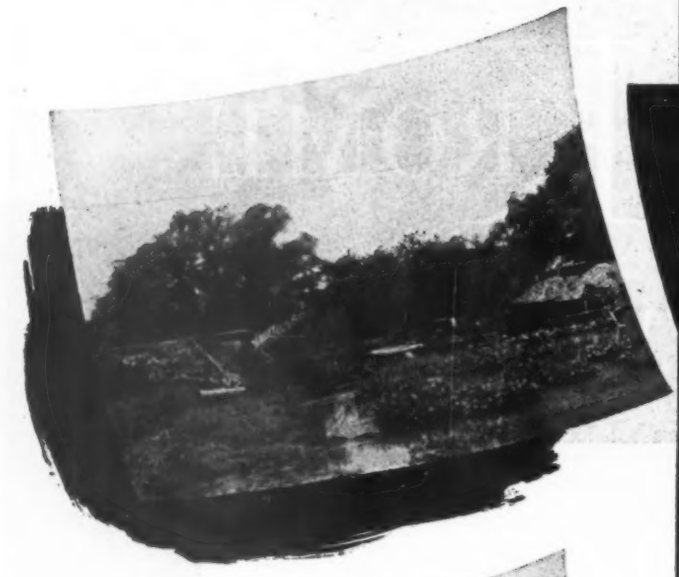
VAN DER HORST

U. S. PATENTS 2,048,578 AND 2,314,004

VAN DER HORST CORPORATION OF AMERICA

AN AFFILIATE OF DRESSER INDUSTRIES

OLEAN • NEW YORK
CLEVELAND 11 • OHIO



Construction of this twin-arch bridge near Moorestown, N. J., was simplified and speeded through use of ARMCO Multi Plate. Each arch has a span of 22 feet and is 40 feet long.

SAVE DAYS AND DOLLARS with "PACKAGED" POST-WAR BRIDGES

V-Day will sound the go-ahead signal on many long-needed small bridge projects. Future-minded engineers are making detailed plans now to replace weakened structures and extend narrow bridges for greater traffic safety and road budget economy. Naturally they are looking at improved methods and materials with a careful eye.

Multi Plate Speeds the Job

You can simplify and speed construction of small bridges, culverts and large sewers by using ARMCO Multi Plate. Assembling and bolting are practically as simple as changing an automobile tire. The easily-handled, pre-curved corrugated metal plates are nested together to save space in shipping, hauling, handling and storage. Unskilled men easily and quickly install your "packaged" structure with the simplest equipment and small tools.

The Multi Plate "form" is the completed structure. No curing, no waste, no delay. Other operations go faster too.

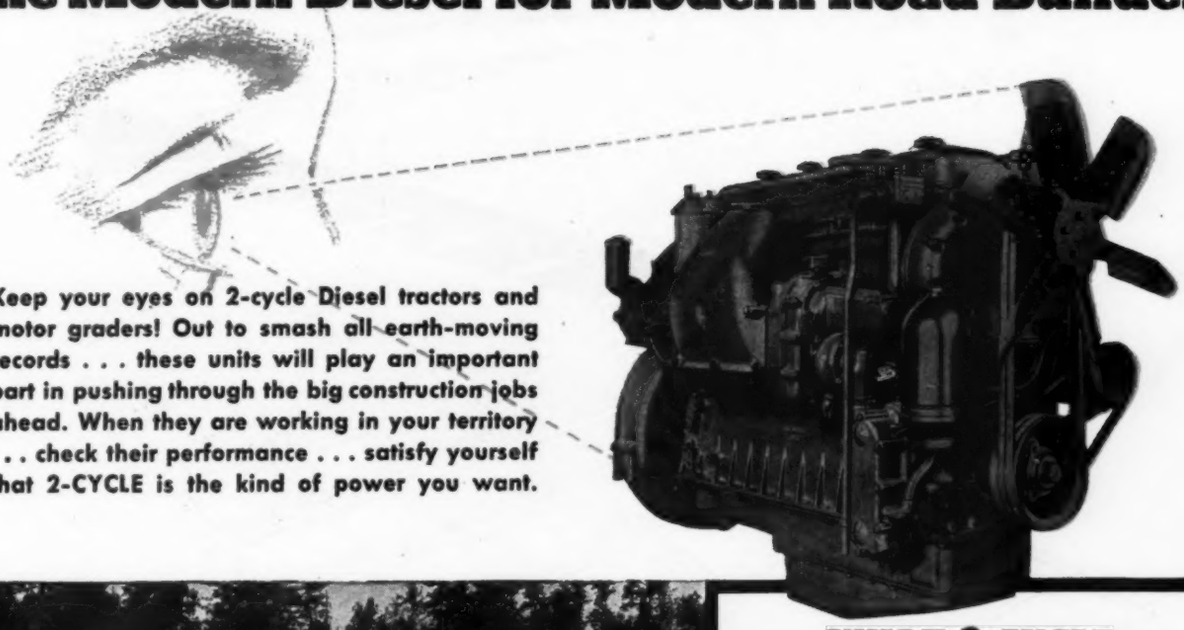
Now is a good time to write us for complete details about Multi Plate. Armco Drainage Products Association, 75 Curtis Street, Middletown, O.

MULTI ARMCO PLATE

Armco Multi Plate

WATCH 2-CYCLE!

The Modern Diesel for Modern Road Builders



Keep your eyes on 2-cycle Diesel tractors and motor graders! Out to smash all earth-moving records . . . these units will play an important part in pushing through the big construction jobs ahead. When they are working in your territory . . . check their performance . . . satisfy yourself that 2-CYCLE is the kind of power you want.

WHAT 2-CYCLE DIESEL POWER MEANS:

TO A TRACTOR

It means *plenty of drive!* Every down stroke of the piston is a power stroke. It means *smooth power* — maintains high torque over a wide speed range. It means *faster power*—there is quick pick-up . . . less gear-shifting . . . high-speed hauling. It means *thrifty power.* Unit injectors simplify fuel system, reduce maintenance cost—fuel is thoroughly atomized, burns completely and develops maximum power.

TO A MOTOR GRADER

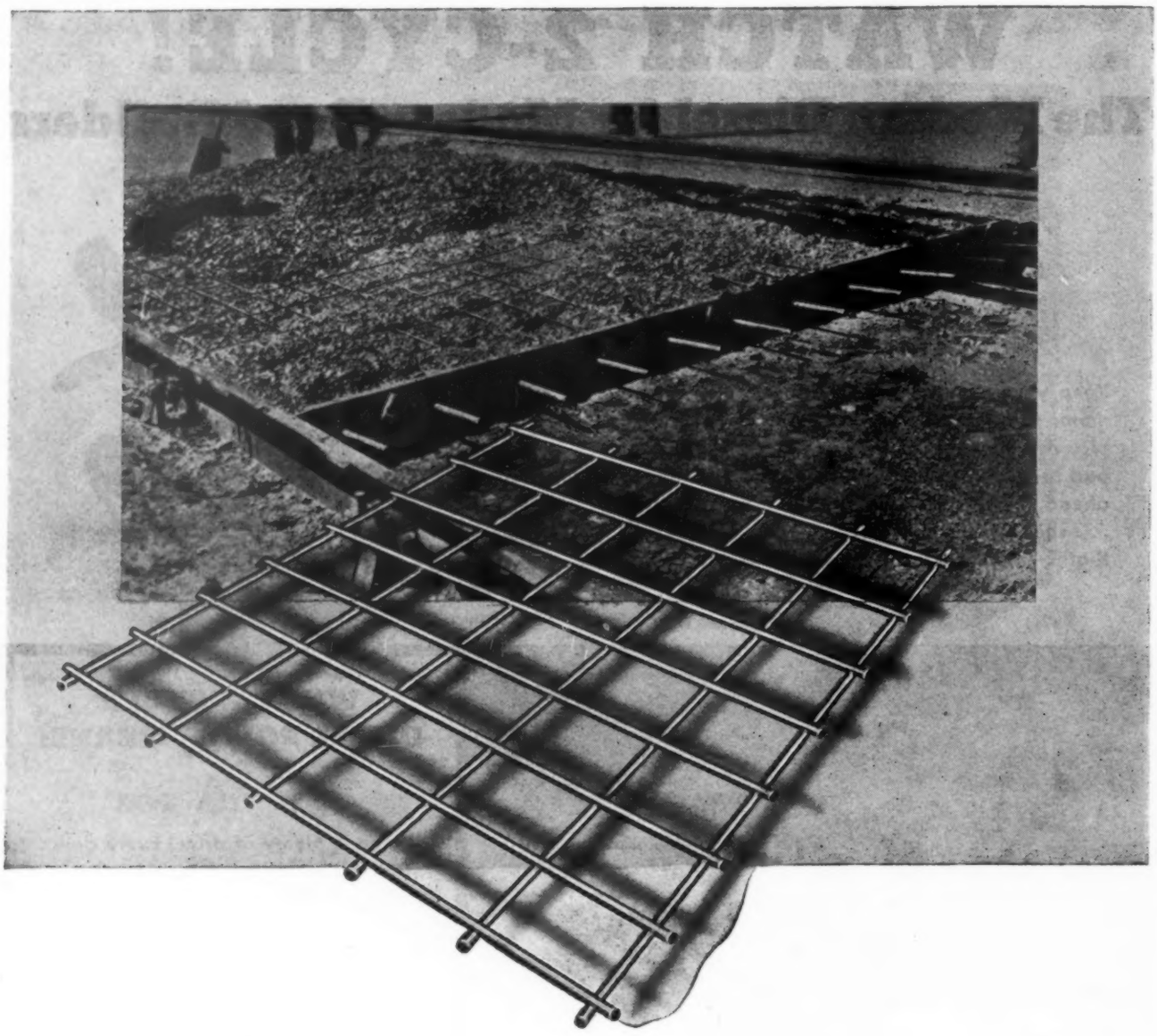
It means power to move *more material.* Extra dirt-moving capacity is built into the A-D Motor Grader. You can handle the heaviest kind of work —from deep, tough scarifying to high, heavy bank cuts. You get *a smoother job,* too — has the reserve power to carry you through tough cuts with fewer blade adjustments. Gets the job done *faster*—works in a higher gear!

KEEP AN EYE ON THE FUTURE

BUY AND KEEP WAR BONDS

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



TRUSCON WELDED STEEL FABRIC
for highway permanence!

You're putting a tough load on highway concrete if you don't give it the *inbuilt strength* of Truscon Welded Steel Fabric.

This permanently-bonded mesh of tremendously strong steel wire imparts great rigidity and life to concrete. It knits together long, wide areas of pavements that are continually exposed to the elements, subjected to constant changes of the earth's surface, and hammered by sudden, sharp impacts from a constant flow of heavy traffic.

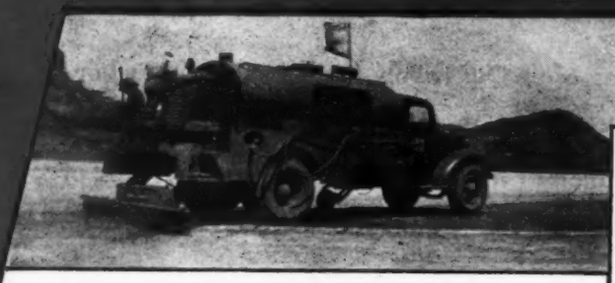
Truscon Welded Steel Fabric Assures:

Resistance to cracking during setting period
Tensile strength against subgrade friction
Resistance to cracking due to warping
Resistance to development and opening of cracks
Resistance to slab separation
Decrease of spalling and disintegration

You can be *sure* that Truscon Welded Steel Fabric Reinforcement, and associated Truscon Steel roadbuilding products, will build better roads for the communities you serve, and greater prestige for you.

TRUSCON STEEL COMPANY, Youngstown 1, Ohio • *Subsidiary of Republic Steel Corporation*

TRUSCON WELDED STEEL FABRIC
• Covers the Continent •



"SPRAY MASTER" SPRAYING ASPHALT ON AN AIRPORT RUNWAY SOMEWHERE IN THE SOUTH PACIFIC.

A TYPICAL VIEW OF THE "SPRAY MASTER" AT WORK SPRAYING A HIGHWAY.

When it comes to spraying Asphalt, Tar, Road Oils, or Emulsions, the "Spray Master" cuts the cost of operation.

The "Spray Master" is not an ordinary Pressure Distributor, but a designed spraying unit that incorporates years of research and actual road work under all conditions. Features found on the "Spray Master" are exclusive Littleford design and are offered as standard equipment.

"Spray Master" Distributors are made in Front or Rear Engine mountings with Standard or Circulating Spray Bars up to 24 feet in width.

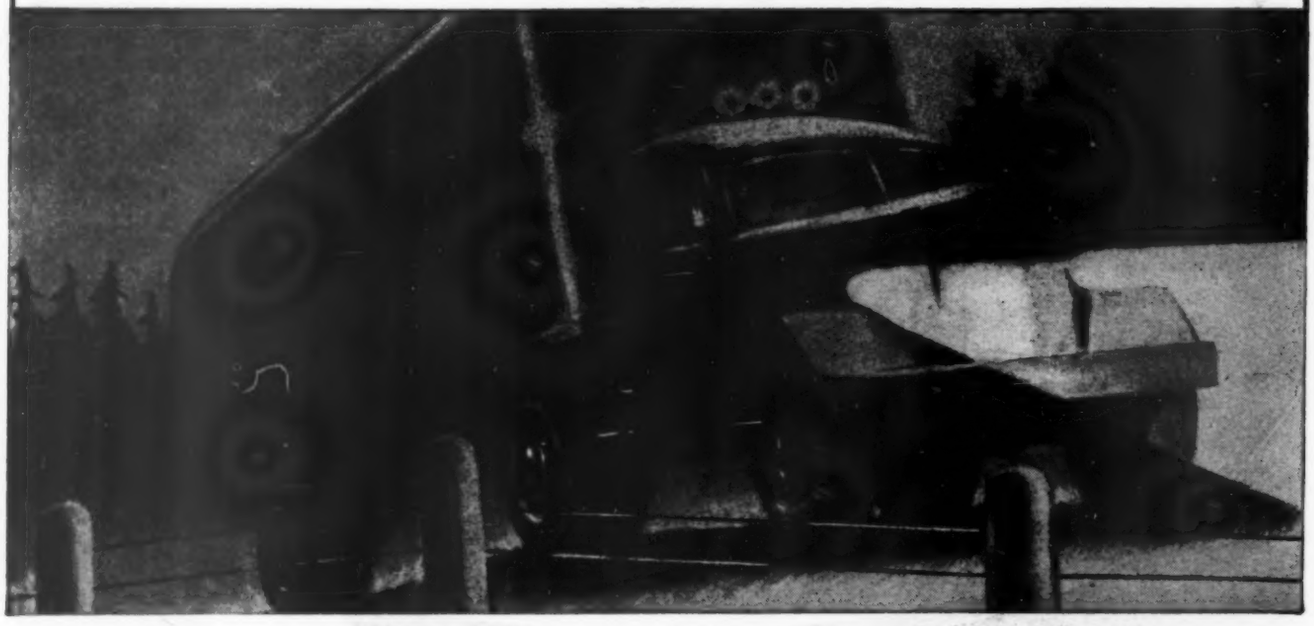
Be ready for the Big Road Building Program, have a "Spray Master" Pressure Distributor ready to do the job.

BLACK TOP ROAD MAINTENANCE EQUIPMENT
LB
SINCE - 1900

LITTLEFORD

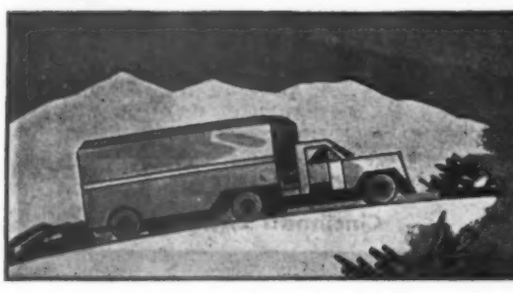
LITTLEFORD BROS., INC.
454 E. Pearl St. Cincinnati 2, Ohio

Better in the Long Run



In spite of prolonged shortages of vehicles, replacement parts and personnel, the motor truck transportation industry successfully has performed a tremendous task in supplying the nation's critical needs swiftly and economically. Now, a limited number of Ward LaFrance heavy-duty trucks for civilian use is available . . . trucks designed and engineered to respond quickly under all conditions and loads.

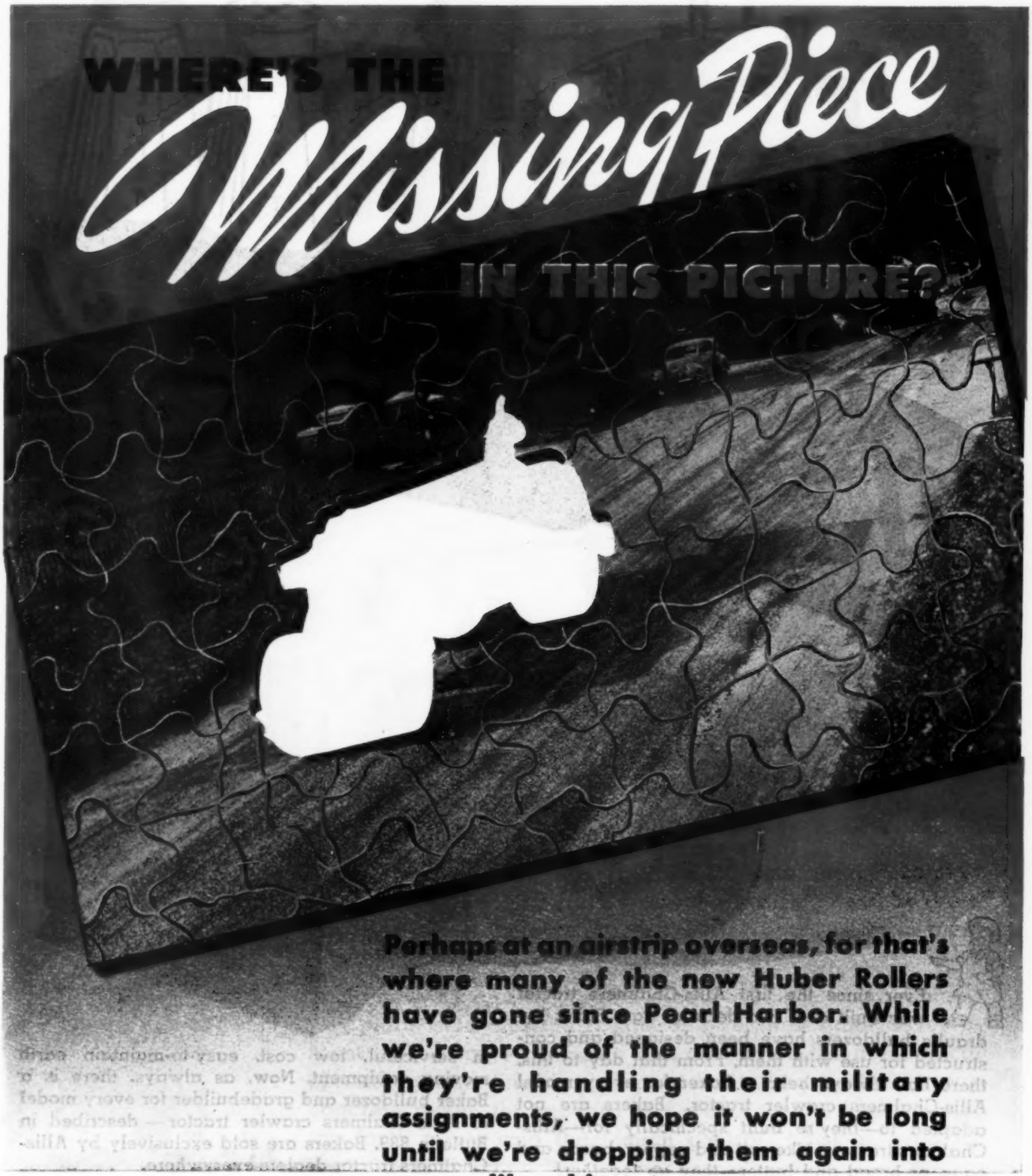
Our twenty-five years of truck manufacturing, plus the experience gained in producing specialized vehicles of war, enables us to build better civilian trucks capable of meeting every demand with reliability and low maintenance cost. Remember that, in the long run, trucks engineered to do a *specific* job do it better! Why not investigate by writing our Sales Department today?



WARD LAFRANCE

TRUCK DIVISION

GREAT AMERICAN INDUSTRIES, INC. • ELMIRA, NEW YORK



Perhaps at an airstrip overseas, for that's where many of the new Huber Rollers have gone since Pearl Harbor. While we're proud of the manner in which they're handling their military assignments, we hope it won't be long until we're dropping them again into scenes like this.

THE HUBER MFG. COMPANY
MARION, OHIO, U. S. A.

HUBER ROLLERS

Ever since the first Allis-Chalmers tractor was built over two decades ago, Baker hydraulic bulldozers have been designed and constructed for use with them. From that day to this, there has always been a Baker for every model Allis-Chalmers crawler tractor. Bakers are not adapted to—*they're built specifically for*—Allis-Chalmers tractors. Like salt and pepper, bacon and eggs, or bread and butter—*they go together!*

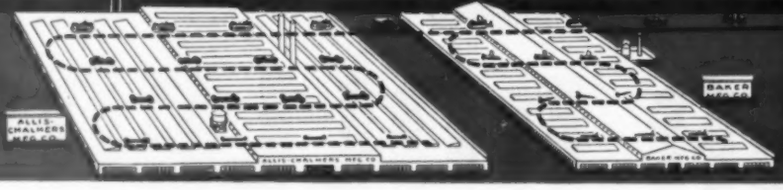
Baker engineering has kept pace with the progressive improvement of Allis-Chalmers tractors until today the modern Baker bulldozer is the ultimate in serviceful, low cost, easy-to-maintain earth moving equipment. Now, as always, there is a Baker bulldozer and gradebuilder for every model of Allis-Chalmers crawler tractor — described in Bulletin 839. Bakers are sold exclusively by Allis-Chalmers tractor dealers *everywhere.*

THE BAKER MFG. CO.

506 Stanford Ave. Springfield, Ill.

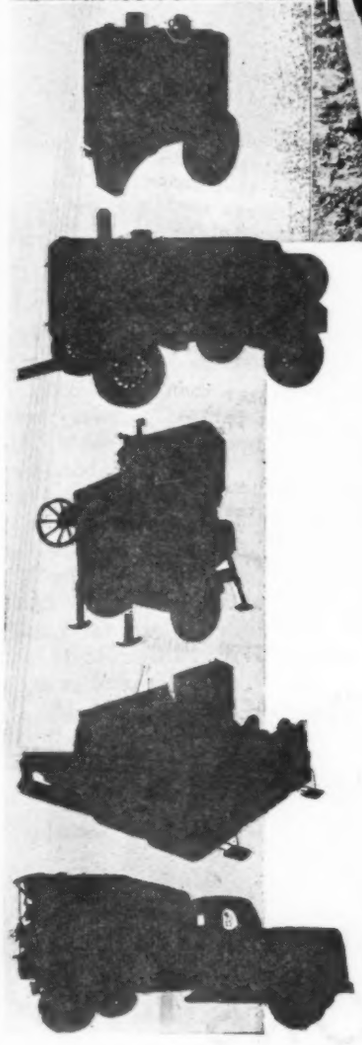
If it Concerns Victory, it concerns us!

"STRAIGHT THROUGH" ASSEMBLY LINE – ALLIS-CHALMERS TO BAKER TO YOU!



The modern Baker plant with its completely equipped fabricating, machining and blacksmithing shops adjoins the Allis-Chalmers crawler tractor plant. When you order an A-C tractor with Baker bulldozer or gradebuilder, your tractor leaves the A-C assembly line, crosses a narrow court and goes on the Baker final assembly line.

Plan for FULL SPEED AHEAD with JAEGER *Advanced* EQUIPMENT



When present billions in "Postwar Projects" start becoming billions in biddable jobs, your Jaeger distributor will be there with the better methods and machines you'll need to meet bid competition.

Right now, he and a hundred others are here at our Columbus plant, studying the results of 3 years of quiet development by the same company that originated the mechanical spreading and finishing of pavements, the end-discharge concrete mixer, the modern self-priming centrifugal pump, the truck mixer and the "touch control" hoist as used by contractors today.

He's seeing new things, including precision-built air compressors. Ask him about them when he gets back home.

THE JAEGER MACHINE COMPANY

223 Dublin Avenue, Columbus 16, Ohio

MIXERS • PUMPS • HOISTS • TRUCK MIXERS
AIR COMPRESSORS • MATERIAL LOADERS

READ THE FACTS!

F. A. McKENZIE, PRESIDENT
JAMES C. McKENZIE, VICE-PRESIDENT
F. A. McKENZIE, JR, VICE-PRESIDENT
SADYE M. McKENZIE, SECRETARY-TREASURER

ATLANTIC DREDGING & CONSTRUCTION COMPANY
OKEECHOBEE FLORIDA

ADDRESS REPLY TO FIELD OFFICE AT
Box 957
Pine Bluff, Arkansas

November 7, 1944

Little Rock Road Machinery Company
813 East Second Street
Little Rock, Arkansas

Gentlemen: --

We are pleased to answer your inquiry relative to our experience with the three MISSISSIPPI WAGONS we purchased from you for use on our 1,096,000 yard levee construction job near Pine Bluff, Arkansas.

We are moving at least 2500 yards of paydirt every 10-hour shift with these units on hauls up to 800 feet one-way, or 1600 feet round-trip. This is a larger volume than we ever secured with three hauling units before under similar conditions. Our haul road is spongy, but due to the flotation of the MISSISSIPPI WAGON, we can carry a full pay load. We also make good speed in spite of the rough haul road, due to the comfort provided the operator, and the ease and safety of the steering, since drivers do not have to worry about having the steering wheel knocked from their hands on rough haul roads.

For the yardage moved, the fuel consumption on the MISSISSIPPI WAGON is less than half of the fuel consumed by any hauling unit we have ever previously used.

We had some hauling to do over extremely sandy haul roads that all of our previous experience definitely indicated could not be accomplished by any rubber tired hauling equipment, but we tried the MISSISSIPPI WAGONS on this haul and found they handled it with ease. We attribute this primarily to the low pressure drive tires used on the tractor, which have an unusually large ground contact area when the weight transfer mechanism was used.

The MISSISSIPPI WAGON has given us the cheapest hauling costs we ever had on construction work, and we feel they will do likewise on long gravel or topping hauls, which eliminates the need for two investments.

The above, plus the fact that they dump sticky buckshot cleaner and quicker than any hauling unit we ever used, and the extremely low cost of replacement parts, satisfies us very much with our investment in MISSISSIPPI WAGONS.

We have had over 30 years experience in the contracting business on various types of construction work throughout the southeastern part of the United States, with contracts for as much as 7,000,000 yards at one time, and we are better pleased with our investment in MISSISSIPPI WAGONS than any hauling units we ever invested in before.

Yours very truly,

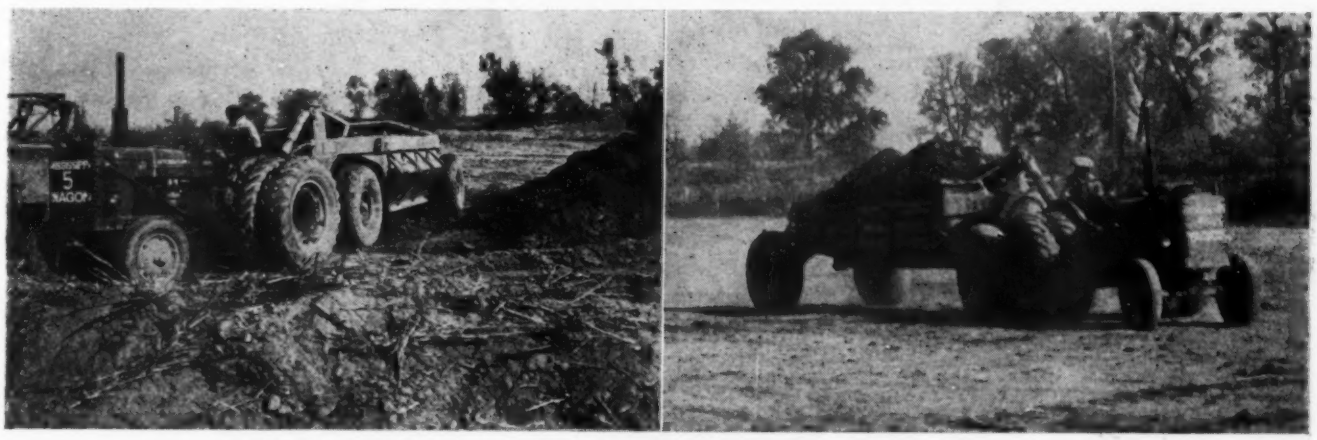
ATLANTIC DREDGING & CONSTRUCTION COMPANY
By F. A. McKenzie Jr
Vice-President

FAMJr:jm

THE ABOVE LETTER GIVES MANY REASONS WHY IT PAYS TO USE

MISSISSIPPI WAGONS

OTHER USER TELLS WHY HE LIKES MISSISSIPPI WAGONS



MISSISSIPPI WAGONS on an Atlantic Dredging & Construction job near Pine Bluff, Ark.

MORE AND MORE CONTRACTORS ARE FINDING MISSISSIPPI WAGONS THE ANSWER TO PROBLEMS IN COMPETITIVE HAULING

Whenever construction equipment—like the MISSISSIPPI WAGON—consistently does a job faster, better and cheaper, it gains more and more friends among contractors. The growing popularity of the MISSISSIPPI WAGON among veteran contractors is further evidence that the MISSISSIPPI WAGON is the "world's most modern hauling unit," designed for long and short hauls of dirt, gravel, topping, stone, coal, etc., over varied types of terrain.

Plan now to include MISSISSIPPI WAGONS in your 1945 operations. Be ready to enter a low bid in competing for hauling work. To fill varied hauling needs, the MISSISSIPPI WAGON is manufactured in three sizes as follows:

Model 75—10.5 yards heaped capacity (with standard sideboards)
Model 85—10.5 yards heaped capacity
Model 120—15 yards heaped capacity

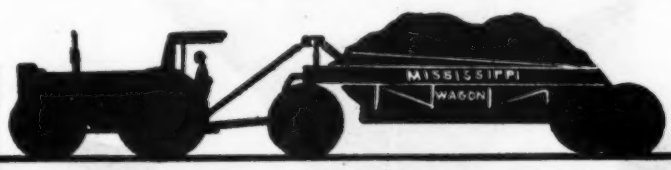
The weight transferring feature, found ONLY in the MISSISSIPPI WAGON, prevents the vicious "beating" a tractor must take with the ordinary semi-trailer hauling unit. This feature adds life to the tractor, provides the extra weight needed for traction during bad going, and holds repairs to an unbelievable low cost.

There are many other features you'll like about this unit. Contact your nearest International Industrial Power distributor, or write us, for full information.

Remember, Postwar Competition Will Be Tough, but not for the owner of the MISSISSIPPI WAGON—

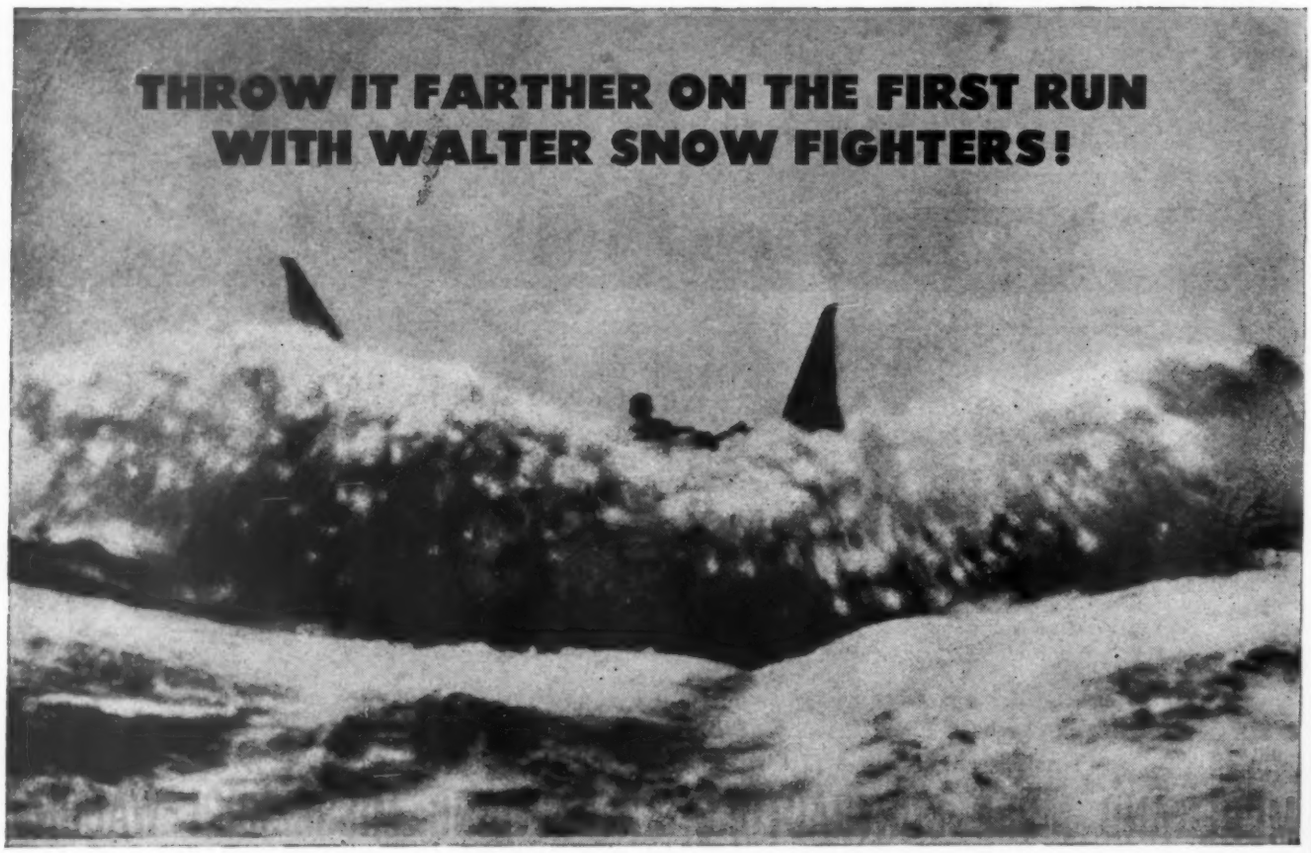
"the World's Most Modern Hauling Unit."

MRS



MANUFACTURING CO.
JACKSON, MISSISSIPPI

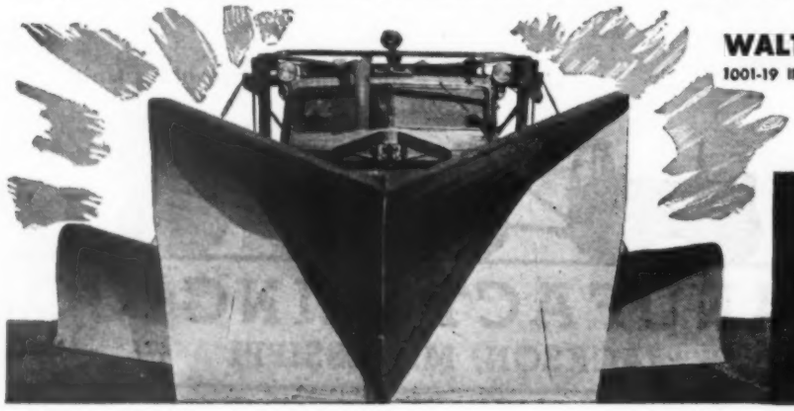
WHY MOVE THE SAME SNOW *Twice?*



When hard-hitting Walter Snow Fighters smash through on their opening runs, they throw snow far to the side. Much less snow remains to be rehandled on the next run. By comparison, slow-moving snow removal units merely turn snow over, piling it higher and higher for each successive run.

Walter 250 h.p. Snow Fighters clear snow faster (up to 30 m.p.h.) because unmatched traction utilizes every last horsepower. They remove a greater volume of snow on each run (clearing a two-lane road in one round trip) because they are designed to mount the biggest, most efficient plowing equipment. By clearing more miles per hours, they remove snow before it packs and freezes into dangerous ruts—gain you extra time for opening more miles of secondary roads.

The exclusive Walter Four-Point Positive Drive provides this outstanding performance. Automatic locking differentials proportion power to FOUR driving wheels according to their traction at any instant—eliminating the wheel-spinning, side-slipping and stalling that slow down or stop conventional trucks. Give your highway system this fast, unfailing protection. Write today for complete literature on Walter Snow Fighters.



WALTER MOTOR TRUCK COMPANY
1001-19 IRVING AVE., RIDGEWOOD 27, QUEENS, LONG ISLAND, N. Y.

WALTER
SNOW FIGHTERS

TIME *is money in road building*

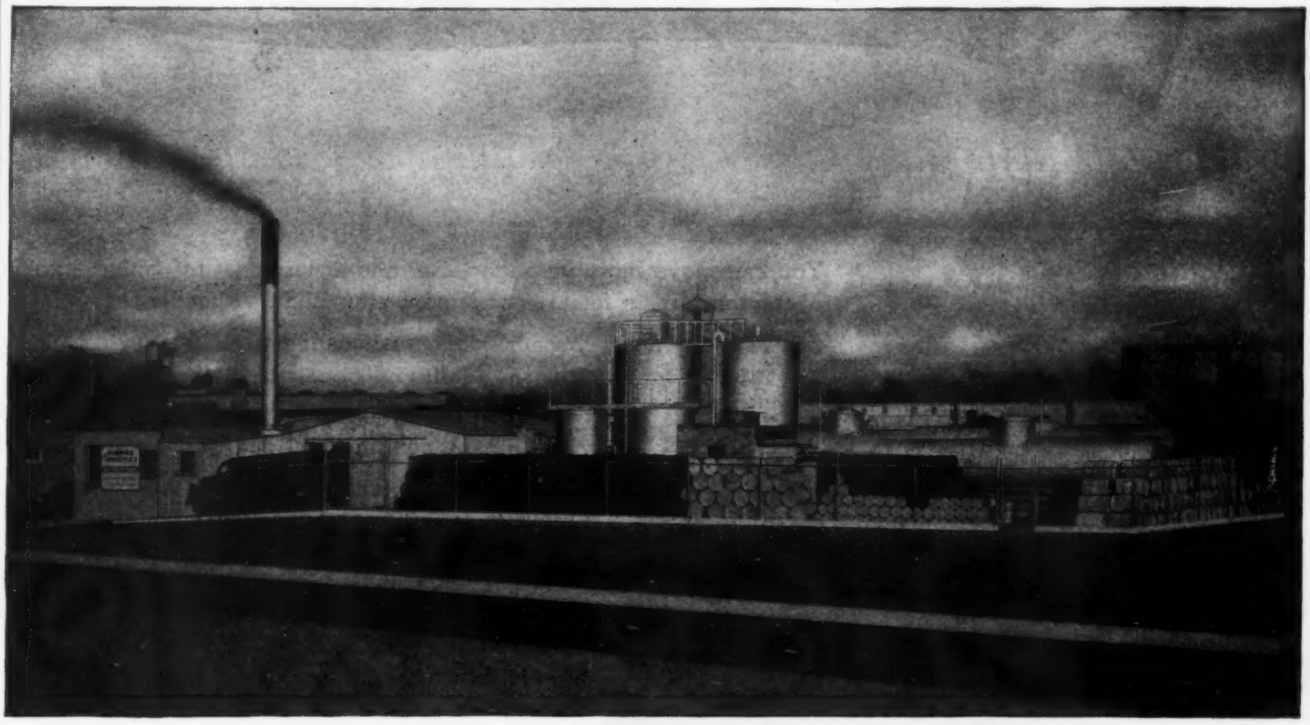
It's time **NOSTRIP**, the *tested and approved** admixture for tar and asphalt, went to work for you! Time that **NOSTRIP**-treated bitumen saved you time and labor dollars on the job . . . putting you days ahead of schedule . . . extending your road season six weeks! Your first drum is our best salesman; it proves an invaluable time and money saver because:

The coated aggregate can be laid at any temperature above Zero; heating or drying is unnecessary. It laughs at water, easily passing the Distilled Water and Nicholson Stripping Tests. The treated bitumen adheres permanently to any road surface, wet or dry . . . even in rainstorms!

NOSTRIP halves blading and mixing time, and used with R. C. cutbacks speeds construction of airport runways, roads and shoulders. It is ideal for bank run gravel or beach sand in coastal regions. A boon to Travel Plants, **NOSTRIP** doubles adhesion. With hydrophyllic aggregates, lime or other additions are never needed.

*You do not experiment when using **NOSTRIP.** It has proven itself in all types of installations for four years and is now used in thirty-three states! Write for laboratory and field test reports, and we will send unbiased testimony from State Highway Officials and contractors . . . You be the judge!

★ *Our large modern plant in Jamaica, N.Y., (below) can produce enough* **NOSTRIP** *to treat 1,000,000 gallons of asphalt per day.*



THE ALL-YEAR ROAD MATERIAL

NOSTRIP

AN ADMIXTURE FOR TAR AND ASPHALT

MAGUIRE INDUSTRIES, INC., NOSTRIP DIVISION, 2010 BROADWAY, NEW YORK 23, N.Y.

Heil Hi-Speed CABLE SCRAPERS

. . . give you faster digging . . . faster hauling . . . faster dumping

Heil Hi-Speed Bottom Dump Wagon carries 12 yard load at 27 M. P. H.

This job-tested unit saves loading time, cuts hauling time, and speeds dumping. You can turn short and fast — and features such as high clearance, self-cleaning doors, lots of power, big tires, and scientific weight distribution for maximum traction mean greatly reduced "weather" delay. The Hi-Speed Tractor can be used interchangeably with the Hi-Speed Cable Scoop to give you alternate pieces of equipment to speed dirt-moving jobs.

ARMY E NAVY

You can move more yardage faster and at less cost by taking advantage of the three main features of famous Heil Hi-Speed Cable Scrapers:

❶ You dig faster because this push-loaded unit gives you a heaped 15-yard load in 40 to 50 seconds.

❷ You can speed away to the fill at travel speeds of 6 to 20 M.P.H. depending on road and grade conditions.

❸ At the fill, this unit spreads the load with a positive mechanical push-out action attained by tilting the floor. This fast, positive discharge is accomplished by a leverage action which exerts a *low line pull* on the unloading cable. The cutting blade remains in a fixed position in relation to the sides of the bowl and does not tilt with the dumping floor. Thus the load can be dumped at any desired height, and at travel speeds permitted by the grade.

Ask your Heil distributor for the complete story of why Heil Hi-Speed Cable Scoops give you fast, profitable dirtmoving at low cost per yard.

Write for special bulletins.

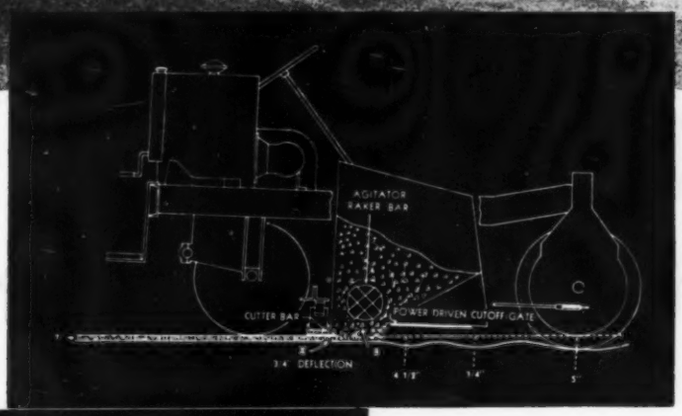
R-1

THE HEIL CO.

GENERAL OFFICES • MILWAUKEE 1, WISCONSIN

The first course showing front wheel dropped into deep depression.

The top course showing how Continuous Course Correction has reduced hole 5" deep to 3/16".



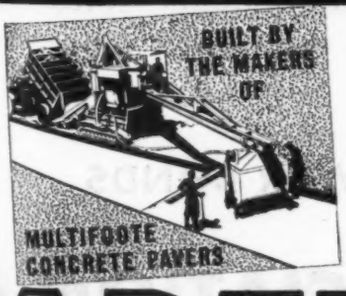
How TO RESURFACE OLD ROADWAYS

with less subgrade preparation

Use the black top paver that automatically reduces the irregularities of the surface with each successive course laid! That's what Continuous Course Correction does in Adnun Black Top Pavers.

The Adnun rides on the finished course close to the cutter bar and well back from the front of the machine. The front wheels can drop into quite a deep depression without materially affecting the leveling action of the cutter bar. For example, a 5-inch drop of the front wheels will leave only a 3/4" depression at the point where the cutter bar is at that time. When the top course is laid, the resulting deflection is reduced to 3/16". Deep holes large enough to permit the wheel to drop the full depth are extreme cases. Generally subgrade irregularities are reduced to insignificance when the top course is laid.

You can lay any mix—hot or cold—any thickness—any width—with an Adnun. You'll be sure of maximum density for your black top paving, tight joints between strips, smoothest finished surface, and all-weather durability. Write today for details or see your Foote distributor.



ARMY (E) NAVY

ADNUN
TRADE MARK REGISTERED
BLACK TOP PAVER

With Continuous Course Correction

THE FOOTE CO., INC.
NUNDA, N.Y.
The World's Largest Exclusive Manufacturers of Concrete and Black Top Pavers.

Street in Jacksonville, Ill. before old pavement was restored with concrete resurfacing.

Same street after application of concrete resurfacing.

CONCRETE RESURFACING
helps stretch paving budgets

CONCRETE RESURFACING:

Saves money in restoring badly worn roads and streets for years of additional service.

Salvages all the strength remaining in old pavement.

Gives added strength to pavement.

Provides adequate load-carrying capacity and clean, smooth-riding surface at cost usually less than new pavement.

Concrete resurfacing with widening frequently will fit old roads and streets to present traffic conditions both as to weight and volume.

Details of construction procedure will gladly be given to state, county or city officials. Write for booklet, "Salvaging Old Pavements With Concrete." Free in the United States and Canada.

BUY MORE WAR BONDS

PORTLAND CEMENT ASSOCIATION

Dept. A1-28, 33 W. Grand Ave., Chicago 10, Illinois

A national organization to improve and extend the uses of concrete . . . through scientific research and engineering field work

NEED a light, easily-held, air-saving sinker for soft or medium rock? The Cleveland H66 fills the bill perfectly. Strong rotation by this 32 lb. model carries even 12-foot drills down full length in any ground. And compressors pop off more often with Cleveland H66's on the hose lines.

The H66 has drop forge construction, swivel air connections, and strong steel puller easily opened by hand. Fast, efficient automatic valve, renewable chuck bushing, and patented lock nuts to keep side rods tight are other important features. Standard chuck: ⅞" hex. x 3¼" collared; quarter octagon also obtainable.

Bulletin 122 describes this drill in detail as well as many larger models of Cleveland Sinkers. *Ask for it!*

"TAILOR MADE" Cleveland Catalog

Let us send a catalog built especially around your own rock drill requirements—no extra pages to thumb through and take up valuable time. Tell us the type of rock drill or other pneumatic machines you are interested in—we'll send a catalog to supply the information you want.

LEADERS IN DRILLING EQUIPMENT

THE CLEVELAND ROCK DRILL CO.

DIVISION OF THE CLEVELAND PNEUMATIC TOOL COMPANY

CABLE ADDRESS: "ROCKDRILL" • CLEVELAND 5, OHIO

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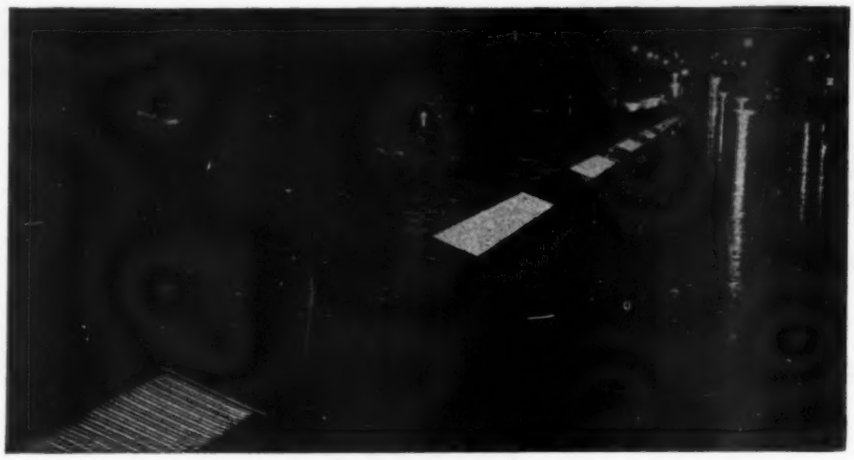
OFFICES: New York, Chicago, Albany, Boston, Philadelphia, Pittsburgh, Minneapolis, Duluth, Cleveland, St. Louis, Kansas City, Des Moines, Birmingham, Waco

SAFER POST-WAR HIGHWAYS

White Concrete Reflecting Curb made with Atlas *White* Cement Provides a White Guide to Safety



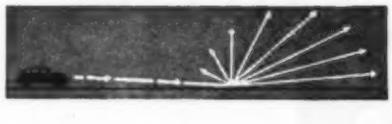
Rainy night view of test installation of alternate sections of smooth white concrete curb and scored-finish reflecting white concrete curb. Note how effectively reflecting curb defines the direction of the road far ahead of the car.

FOR normal night driving the only effective source of light is the driver's headlamps, and his guide to safety is the road's edge. Curb defines the road's edge but does so effectively only when it is highly visible. It is visible at night only when it reflects light and then only when it reflects that light in the right direction; namely, back to the driver.

White Concrete Reflecting Curb, made with Atlas White cement, is highly visible at night because it meets the two requirements for visibility: (a) its light color makes it a *good reflector;* and (b) its saw-tooth faces reflect the headlamp rays in the *proper direction*—that is, back to the driver. The illustrations below show why.

Before planning new highways or improving present ones, write to our Atlas White bureau for your copy of the book, "A White Guide to Safety." It shows how to design, make and install White Concrete Reflecting Curb.

A smooth curb (left) wastes light . . . reflects it up and away from the driver. A White Concrete Reflecting Curb (right) conserves light . . . reflects it back to the driver. A smooth curb is barely visible at night; a White Concrete Reflecting Curb stands out—bright and clear.



2½ MILLION SQUARE YARDS

of Street, Road and Airport Paving With Atlas Duraplastic* air-entraining portland cement

Atlas Duraplastic cement has been used for paving since 1939. Each year has shown an increase both in the number and types of installations and in the number of engineers and contractors who have specified and used Duraplastic. Today these installations total over 2½ million sq. yds. of highly scale-resistant paving.

Duraplastic cement is easy to use. It minimizes segregation and bleeding and makes a more workable, more durable concrete that spreads, screeds and finishes more easily.

Write for further information on the use of Duraplastic, the cement that makes concrete more durable and more plastic. Ask for reprints of articles from technical journals giving details of actual installations.

*Trade Mark registered, U. A. C. Co.
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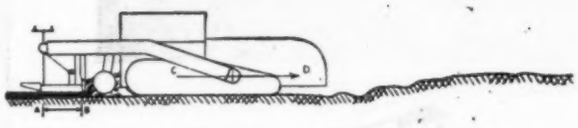
RS-CD-6

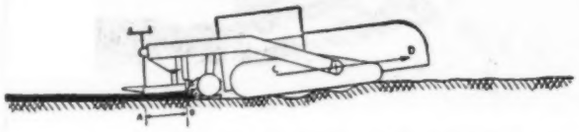
UNIVERSAL ATLAS CEMENTS

UNIVERSAL PORTLAND • ATLAS PORTLAND • ATLAS WHITE • ATLAS DURAPLASTIC • ATLAS HIGH-EARLY

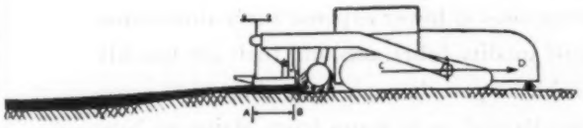
HOW A B-G FINISHER LEVELS OVER THE BUMPS



With the screed adjusted for a given thickness, its undersurface, "AB," is kept parallel with the line "CD" by means of a long leveling arm.



As the crawler moves to a higher point, the screed bottom, "AB," is automatically tilted up, seeking to remain parallel with the line of pull, "CD."



The screed will then climb upward until the line "AB" is again completely parallel to the line "CD." Thus, the mix is tamped into the depression, leaving a smooth, gently-rising surface.

• Dangerously cracked and broken pavements are restored to a safe surface . . . traffic-trampled highways are transformed into smooth-riding roads with the aid of the leveling device on a Barber-Greene *Tamping-Leveling* Asphalt Finisher.

Two pivoted arms connect the tractor and screed units. These long arms account for the delayed action of the screed when the machine is climbing or descending to any new level. A rise or fall of several inches in the tractor unit is reflected only slightly on the screed plate, preventing sharp depressions or bumps in the final surface.

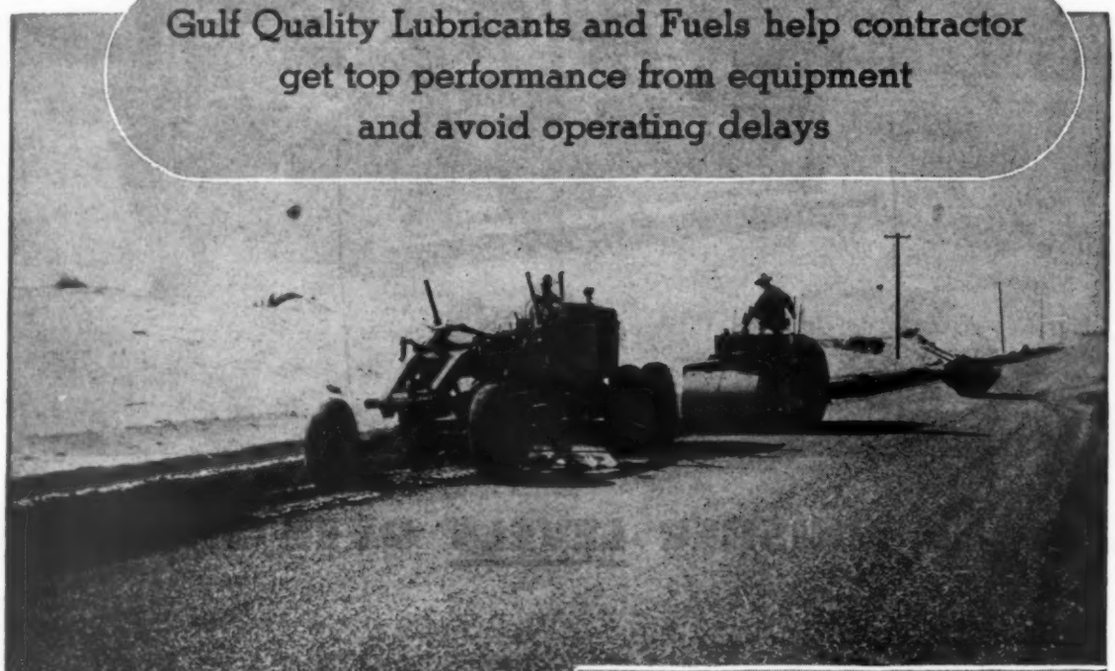
As the crawlers change level, the level of the screed is automatically, but *gradually*, altered—for it constantly seeks to keep in line with the direction of pull. And, helping to make the finished surface smoother still are the long tractor crawlers that bridge a large number of the depressions. Consequently, many changes in the level of the screed plate are avoided. For complete details on the leveling principle of the B-G Finisher write for Catalog 879. Barber-Greene Company, Aurora, Illinois.

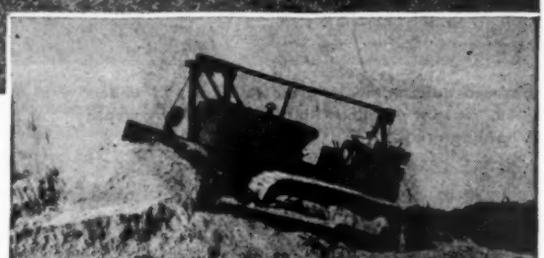
45-1

Barber-Greene B-G *Constant Flow Equipment*

Airport road project 2 weeks ahead of schedule—

Gulf Quality Lubricants and Fuels help contractor get top performance from equipment and avoid operating delays





James H. Craggs Construction Company, Ocala, Florida, is 2 weeks ahead of schedule in grading and paving roadway between Fernandina Beach and Fernandina Airport, Florida. Grading involved 90,000 cu. yds. of earth. Gulf quality petroleum products used on this job include Dieselube H. D., Transgear Lubricant E. P., Solar Fuel Oil and Good Gulf Gasoline.

"OUR equipment has made an outstanding record on this job with Gulf lubricants and fuels in service—one of the important reasons we're 2 weeks ahead of schedule," says Superintendent R. V. Fitzgerald. "Proper lubrication and efficient fuel performance have helped us get the most out of each unit and avoid operating delays—which means more work done on every shift."

The progress and profit on any dirt-moving or paving job depend to a large extent on the efficiency of the equipment that does the work. That is why many leading contractors use Gulf quality lubricants and fuels as basic job insurance—they know from experience that equipment performs better, stays on the job longer, and operates at lower expense for maintenance.

Gulf quality lubricants and fuels are quickly available to you through more than 1200 warehouses located in 30 states from Maine to New Mexico. Write, wire, or phone your nearest Gulf office today.

GULF

GULF OIL CORPORATION
GULF REFINING COMPANY
GULF BUILDING, PITTSBURGH 30, PA.

Tournapulls are quickly pusher loaded. Single pusher easily handles loading of 3 or 4 Tournapulls, depending on haul length.

HOW TO REPLACE OBSOLETE RIGS and *Reduce Equipment Investment*

USE FAST-MOVING TOURNAPULLS . . . You'll Load, Haul and Spread with Same Rig . . . Move More Yardage Faster and at Less Equipment and Labor Cost

With Tournapulls you get Carryall Scraper digging and spreading efficiency plus truck hauling speeds. You eliminate such one-purpose tools as shovels and elevating graders for loading, trucks for long hauls, and special spreading tools on fills. Result: you cut equipment investment almost in half, move more yardage with fewer operators and fewer units.

MORE POWER FOR WEIGHT

The Super C Tournapull has 150 h.p., yet weighs but 31,000 lbs.—22,500 to 39,000 lbs. less than crawler-scraper outfits of comparable output capacity. And Tournapull design centers that weight and power on two big rubber-tired drive wheels to give you maximum traction and flotation for tough grades and soft underfoot conditions. These big drive tires have practically no wearing parts, reduce your maintenance costs and downtime by cushioning equipment against shock.

HAUL FROM 300' to 3 MILES PROFITABLY

What's more, the Super C operates at 2.6 to 14.9 m.p.h.—2 to 3 times faster than the fastest crawling tractors. With it you can move dirt cheaply on both long and short hauls—from 300' to 3 miles.

Why use slow-moving, overweight equipment when you can move more yardage, more profitably with faster-moving, job-proved Tournapulls? Talk to your LeTourneau dealer NOW about replacing obsolete equipment with faster-powered Tournapulls.

Tournapulls spread their own loads on the move. Smooth fills and good haul roads, as shown here on Mannix & Company's job near Banff, Alberta, enable you to get into high gear quicker and stay there, thus increase hourly trips and yardage.

LETOURNEAU TOURNAPULLS

JOB-PROVED BY ALERT EARTHMOVERS

Also LeTOURNEAU (Aust.) Pty., Ltd., Rydalmere, N.S.W., Australia.

Manufacturers of TOURNAPULLS*, DOZERS, CARRYALL* SCRAPERS, POWER CONTROL UNITS, ROOTERS*, SHEEP'S ROOT ROLLERS, TOURNAROPE*, TOURNA-TRAILERS*, TOURNAWELD*, TOURNACRANES*, *Trade Mark Reg. U. S. Pat. Off.

2600 BUILT & SHIPPED

RUBBER-TIRED POWER FOR FASTER EARTHMOVING

RUST—a nuisance and a very costly menace in many places no longer need be tolerated. Laboratory magic has furnished its master.

New Sinclair products, developed to solve tremendous military rust problems, are now available for your problem.

Sinclair RUST-O-LENE B for exposed metal surfaces of machinery in operation, in storage, or in transit

—provides a firmly-adhering rust proofing film
—prevents rusting of clean surfaces
—halts further rusting of corroded surfaces
—has lubricating qualities
—defies any degree of moisture from mere dampness to heavy rain
—can be readily removed when desired

Sinclair OPALINE RP (Rust Preventing) OILS for enclosed oil systems, prevent internal rusting of engines, hydraulic systems, gear reducers, and similar machinery intermittently operated, stored, or transported. OPALINE RP also has ample lubricating qualities for temporary use.

Both these remarkable Sinclair rust-preventives have successfully passed the most exacting service tests, and fully meet Government specifications.

Learn how RUST-O-LENE B and OPALINE RP can combat rust for you. Write for brochure giving full details.

SINCLAIR LUBRICANTS-FUELS

FOR FULL INFORMATION OR LUBRICATION COUNSEL WRITE SINCLAIR REFINING COMPANY, 630 FIFTH AVENUE, NEW YORK 20, N. Y.

Simplicity...

ANOTHER IMPORTANT FACTOR OF EXCELLENCE IN

GEMMER STEERING

Gemmer Steering Gear design embodies that simplicity which is the essence of high quality design. There are only a few parts—nothing to get out of order or require frequent adjustment.

Such simplicity makes for exceptional sturdiness without excess weight or bulk—makes for compactness—makes for ease of installation. Weight saving is accomplished without sacrifice of overall capacity or steering arm angularity. Husky steel forgings provide abundant strength, durability—ample safety factor. Internal stresses are low.

Additional essential qualities contributing to the worth of Gemmer Steering are found in:

TEETH THAT ROLL—No sliding contacts between gear teeth. The hourglass worm bears on *teeth that roll*—providing highest efficiency—smooth, easy transfer of power.

STABILITY—Inherent design banishes "lost motion", and reduces wear to the least possible minimum. Steering is always firm, responsive, positive, with absence of rubbery feeling or wander.

ANTI-FRICTION BEARINGS—at all critical points—particularly important to efficiency where motion is relatively slow.

GEMMER STEERING demonstrated its worth in all types of peacetime automotive vehicles from lightest passenger cars to heaviest buses, trucks, roadbuilding machinery, and agricultural tractors. An equally commendable job is being accomplished on wide variety of vehicles and boats for our armed forces.

GEMMER—PIONEER OF HIGH EFFICIENCY STEERING

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STOODY SELF-HARDENING

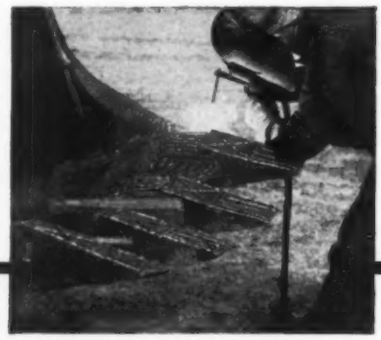
POSTPONES POWER SHOVEL OVERHAULS

LOWERS OVERHEAD COSTS

There's no easier way to postpone power shovel overhauls than to strike directly at the major cause of repairs. Abrasion, constantly gnawing away the life of moving parts and enforcing premature overhauls, might never be completely eliminated; *but its destructive action can be greatly retarded with Stoody Self-Hardening,* resulting in less downtime, fewer replacements and more cubic yards of material moved between overhauls. Wear resistance of Stoody Self-Hardening is *double* that of ordinary manganese steels and it takes so little to get maximum effective wear resistance. This is true because on large areas needing protection Stoody Self-Hardening need not be applied solidly but should be deposited in stringer beads spaced 1½" apart. Spacing saves 75% of the hard-facing metal and numerous hours of welding time, yet provides wear resistance comparable to solid deposits.

And when the Self-Hardening is worn away, your shovel parts are still in excellent shape . . . need only another application of Stoody Self-Hardening to restore them to *better than new condition!*

PUT STOODY SELF-HARDENING TO WORK ON YOUR SHOVEL PARTS NOW! Here's where you need maximium protection:



BUCKET TEETH. Stoody Self-Hardening stringers keep bucket teeth sharp and out to size. When applied parallel to tooth travel, maximum resistance to impact will result. Avoid solid deposits on teeth.

BUCKET LIPS AND RUNNERS. On large areas run single beads of Stoody Self-Hardening parallel to bucket travel when handling coarse materials; apply checkerboard patterns for maximum wear protection from loose earth.

TRACK PADS. Prevent wear on pad lugs and maintain original size and shape with solid Stoody Self-Hardening deposits on inside lug faces and leading and trailing edges. Roller paths should be similarly hard-faced.

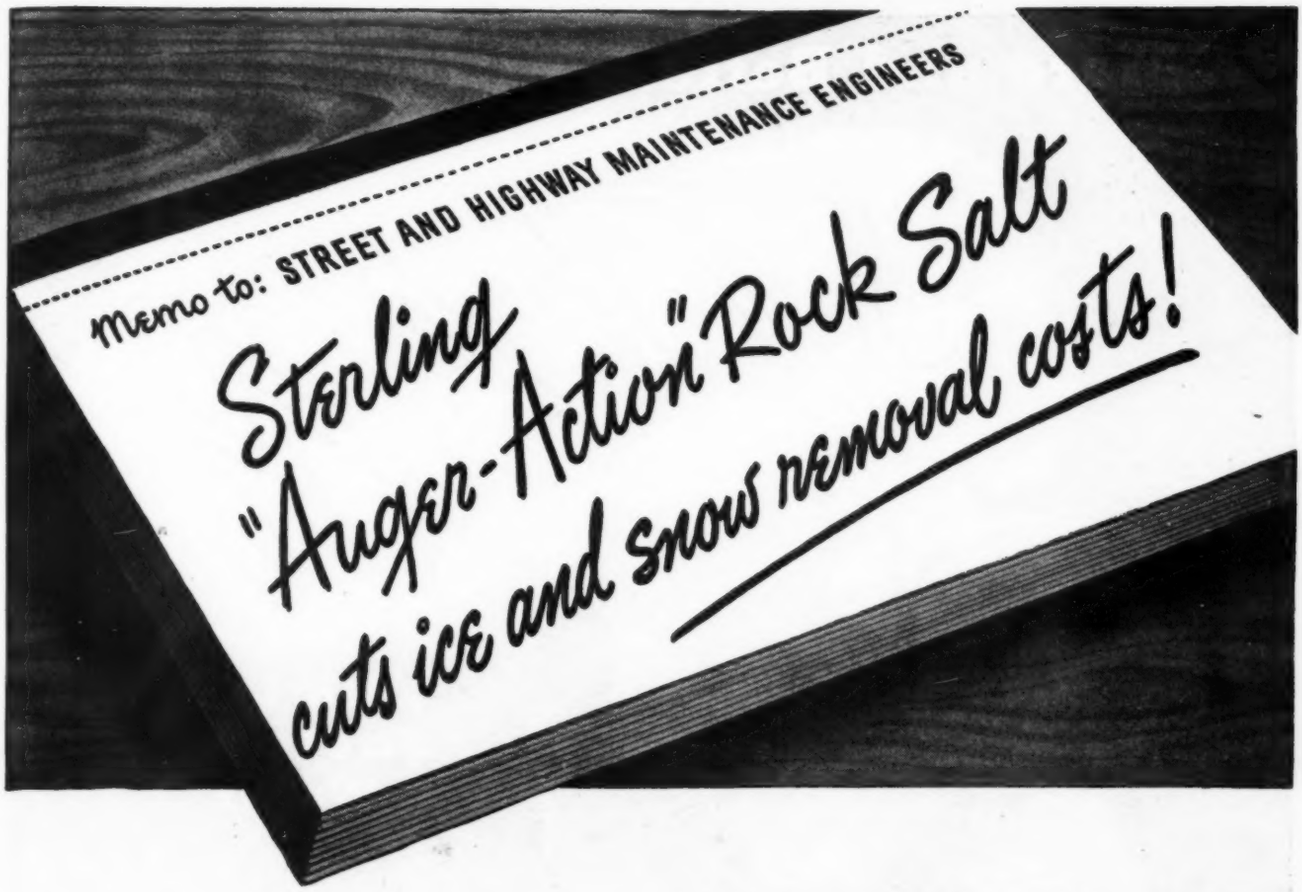
TRACK ROLLERS. A single layer of Stoody Self-Hardening keeps track rollers out to size almost indefinitely, reduces track slapping due to roller rim wear and keeps shovel weight off idlers and tumblers.

DRIVE TUMBLERS AND IDLERS. Lugs on drive tumblers mesh more accurately with track pad lugs when kept out to size with Stoody Self-Hardening. Wear is greatly reduced because of lower coefficient of friction. Idlers are maintained rounder and truer when working in fixed positions.

Many other equipment-saving applications with Stoody Self-Hardening are described in our booklets, "Stoody Specification Sheets" and "Hard-Facing, Industry's Weapon Against Wear"—write for free copies!

STOODY COMPANY
1125 WEST SLAUSON AVE., WHITTIER, CALIFORNIA

STOODY HARD-FACING ALLOYS
Retard wear . . . Save Repair



ALERT OFFICIALS of states, counties and cities throughout the nation's ice, snow and sleet belt are finding out for themselves how Sterling "Auger-Action" Rock Salt cuts winter maintenance budgets. Highway Departments report savings of from one-third to one-half with "Auger-Action" Rock Salt. These same departments find, too, that roads and streets are cleared far more quickly with rock salt than with any other method of ice removal.

Here's how—

Sterling "Auger-Action" Rock Salt, applied early in a storm, prevents snow from packing and bonding to the pavement—makes complete removal with scraper or plow fast and easy.

Sterling "Auger-Action" Rock Salt, used straight without abrasives, effectively treats five times as much street surface as other ice control materials, thereby saving time-consuming hauls from supply points. One crew, one piece of spreading equipment, does the work of five using old-fashioned methods.

There is no better winter than *this* winter to prove to your own satisfaction what "Auger-Action" Rock Salt can do for you in your own area. Put it to every test to confirm the experience of satisfied users.

HERE'S HOW "Auger-Action" WORKS

When ice has once formed, Sterling "Auger-Action" Rock Salt pellets act first as an abrasive on the surface of the ice or compacted snow—roughening and channeling it. Then they bore clear through to the pavement beneath—honeycombing the ice or packed snow. The brine produced by the rock salt's fast melting action spreads out on the pavement surface—undercutting the bond between the pavement and the snow or ice sheet.

Thus loosened and further broken up by passing traffic, complete removal by scraper or plow is fast and easy—giving a bare, safe-driving surface.

Let Our Engineers Help Solve Your Ice and Snow Removal Problems

International Field Engineers are available for free consultation on every ice and snow removal problem. Bulletin with full details on the use of "Auger-Action" Rock Salt for snow and ice control is yours for the asking. Address International Salt Co., Inc., Dept. RS-1, Scranton 5, Pennsylvania.

STERLING "Auger-Action" ROCK SALT

...Designed and Built by Steam Generator Experts

TRIM — compact — highly perfected, the Cleaver-Brooks Tank-Car Heater looks and performs like the "finished" product it is.

No other equipment equals Cleaver-Brooks in fast, low-cost, dependable performance—no other equipment has the original and exclusive four-pass, down-draft flue travel and integral fuel-oil burner construction, plus the *perfected* positive dry-coil method of condensate return.

Cleaver-Brooks design and construction provides more and better steam—faster with far less fuel and water. Hot, dry steam flows to car coils in 25 minutes or less —there is no "water-wagon" problem as every drop of condensate is returned to the car heater under pressure.

Cleaver-Brooks heaters are the perfected product of the pioneers and originators of tank-car heaters and bituminous boosters—built by specialists in the construction of portable and stationary steam generators for construction, industrial and military uses. Military engineers usually assign Cleaver-Brooks equipment to the difficult jobs — the hardest chores — because they recognize Cleaver-Brooks' proven capacity and reliability.

Available in two and three tank-car sizes — write for catalog and complete information today — for the jobs to come at war's end.

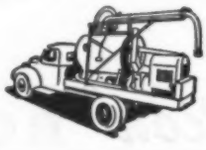
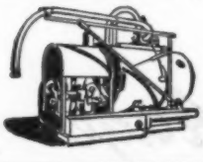
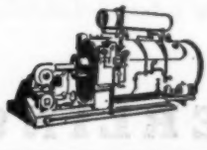
CLEAVER-BROOKS COMPANY

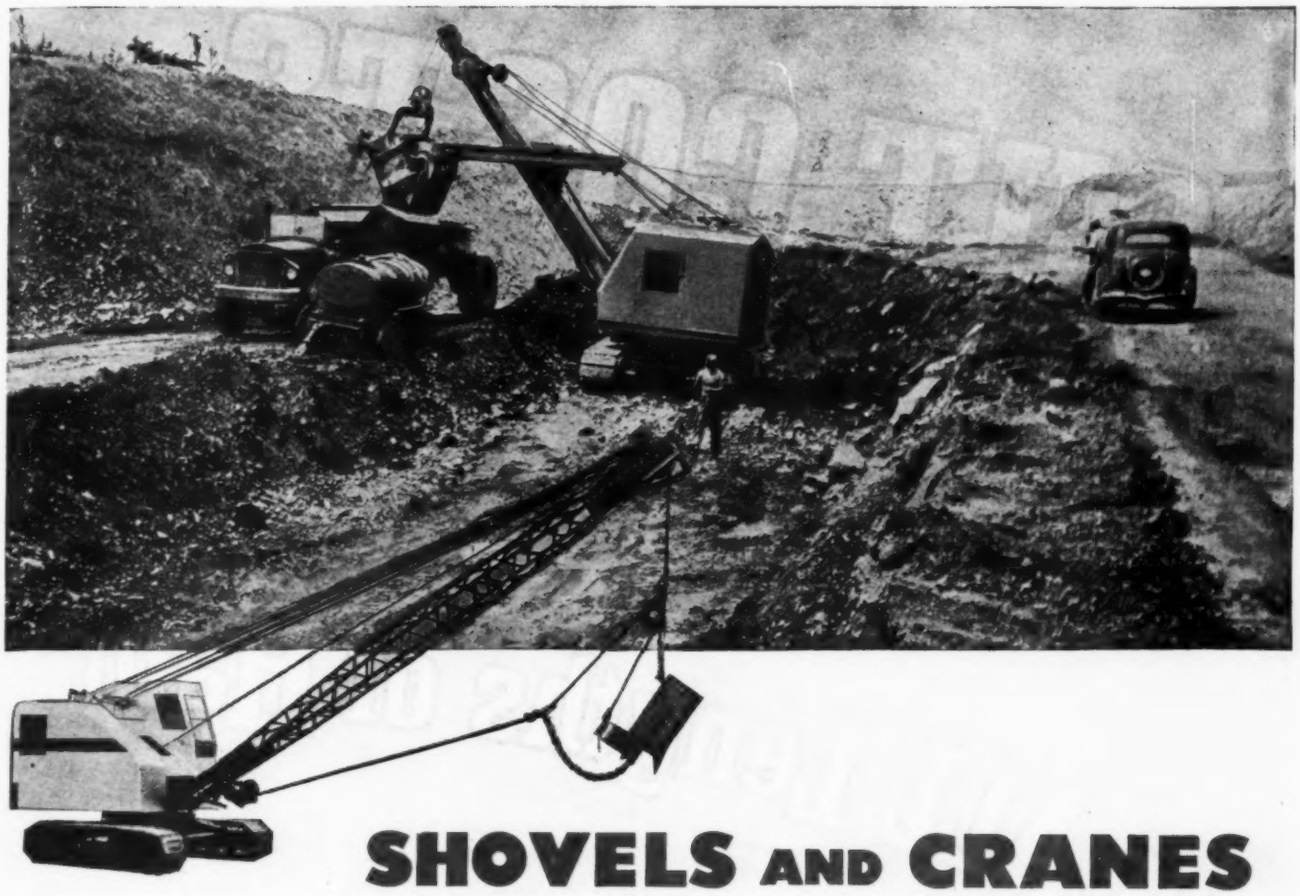
5106 NORTH 33rd STREET
MILWAUKEE 9, WISCONSIN

Cleaver-Brooks

PIONEERS AND ORIGINATORS OF

TANK CAR HEATERS . . . BITUMINOUS BOOSTERS . . . AUTOMATIC STEAM PLANTS



SHOVELS AND CRANES
CRAWLER AND TRUCK MOUNTED

Engineers and contractors know that Uncle Sam is getting all of today's Hanson Production. They have to wait but they're looking ahead. They realize that tomorrow's working conditions will call for the most efficient equipment they can buy. Their experience with Hansons tells them that Hanson Shovels and Cranes will give them what they need to meet the toughest conditions. So the far-seeing ones are checking now on the possibility of Hanson deliveries.

If you don't know Hansons, it's a good time to find out about them. Get full information now. Then you'll be set for the big jobs ahead.

⅜ and ½ Cu. Yd. Capacity Shovels
4 and 6-Ton Capacity Cranes

Full Revolving—Low Center of Gravity—Rugged Welded Steel Construction—Flexible—Speedy—Safer

Convertible to

Shovel—Crane—Dragline—Pile Driver—Clamshell—Trench Hoe

THE HANSON CLUTCH AND MACHINERY CO.
TIFFIN, OHIO

CUT COSTS on ALL Lengths of Haul

Time saved in loading . . . on the haul road . . . and on the dump or fill . . . means more round trips per hour and more yards or tons moved per day. Rear-Dump and Bottom-Dump EUCLIDS are engineered for off-the-highway service and are economical on both short and long hauls.

Fast, easy loading by modern excavating equipment, coupled with Euclid speed and efficiency on the haul road, is the surest way to cut your hauling costs on all types of jobs. Your Euclid distributor or representative is at your service to provide information and to help with plans for your present or post-war hauling equipment.

A new pictorial booklet "Bottom-Dump EUCLIDS On The Move" is yours for the asking. Write for your copy of this interesting booklet today.

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLID SELF-POWERED HAULING EQUIPMENT For EARTH ROCK COAL ORE

WHEN THE INDUSTRIAL GIANT RETURNS TO PEACE-TIME PRODUCTION

PUT *Gar Wood Service* TO WORK FOR YOU

We're in this war . . . right up to our ears. Gar Wood Industries, Inc. was among the first to convert ALL production into war work . . . and we'll keep producing more and more fighting equipment to back up our fighting men all over the world.

But we've an eye on the future, too. When Victory has been won and industry returns to normal peace-time production, Gar Wood will be prepared to serve customers and users better than ever before. Look to Gar Wood for the specialized equipment you want WHEN you want it. Branches and Distributors in all principal cities.

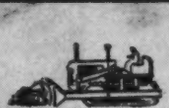
BUY U. S. WAR BONDS TO
ASSURE EARLY VICTORY

SIX DIVISIONS . . . TO SERVE YOU BETTER THAN EVER BEFORE

HOISTS AND BODIES

WINCHES AND CRANES

TANKS



ROAD MACHINERY

HEATING EQUIPMENT

MOTOR BOATS

GAR WOOD INDUSTRIES, INC.

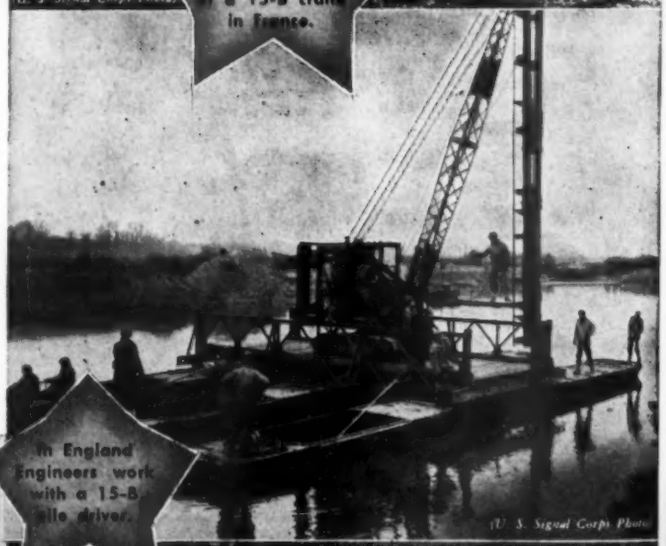
DETROIT 11, MICH. WORLD'S LARGEST MANUFACTURERS OF TRUCK AND TRAILER EQUIPMENT

UNSUNG STARS OF A FIGHTING TEAM

MEN who know their jobs and do them with outstanding effectiveness — this description fits not only our incomparable fighting men but equally the men who operate excavating equipment on the fighting fronts. Skilled in excavation, they give to their brothers in combat the help they need to win more quickly, playing superbly their positions on an invincible fighting team.

Of them and of the significance they have given to excavators in war, Bucyrus-Erie is proud. It is proud, too, that so many of the machines at the fingertips of these skilled men are speedy, smoothly-performing Bucyrus-Eries—as always, leaders in their field.

V-88



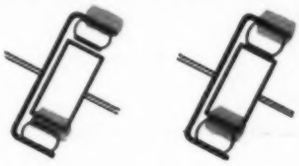
BUCYRUS ERIE

South Milwaukee, Wisconsin

Proved for You

by an unequaled NAVY RECORD

The Fawick Airflex CLUTCH CONTROLS POWER BY AIR



Here is the way it works

Let air under pressure into the rubber-and-fabric gland, and the clutch engages. Let the air out and it disengages. You can have as light, or as firm, a grip as the job requires.

Under battle conditions, Navy vessels equipped with the Fawick Airflex Clutch have greater maneuverability, and more reliable performance, than naval engineers ever thought possible.

This is proved by the records of thousands of Diesel-powered ships of various types.

Power controlled by air! Power controlled without springs, arms or levers, requires no lubrication, needs no adjustments!

The same clutch has been engineered for industrial use in heavy-duty service—with performance records matching those made on the sea.

The Fawick Airflex Clutch is used with remarkable success on:

Diesel Drives	**Rubber Mills**
Heavy Presses	**Mine Hoists**
Drags and Cranes	**Oil Field Drives**
Paper Mills	**Sugar Mills**
Steel Mills	**Power Shovels**

Our Engineering Department will gladly give you complete data, and recommendations based on experience.

FAWICK AIRFLEX COMPANY, INC.
9919 Clinton Rd. • Cleveland 11, Ohio
In Canada, **Renold-Coventry Ltd., Montreal, Toronto, Vancouver**
In Britain, **Crofts Engineers, Ltd., Bradford, England**

FAWICK *Airflex* CLUTCH

POWER CONTROLLED BY AIR

KOEHRING *Half-Yard* 205 SHOVEL

2 *in* 1 SHOVEL BOOM SAVES COST OF EXTRA PULL SHOVEL BOOM

A new idea in small shovel design, built into the new Koehring 205. You save approximately ½ of the cost of the pull shovel attachment because the same boom handles both dipper and pull shovel. You save in everyday operation because boom stays in place, cutting change-over time to the minimum. 100% welded and of box type construction, the 2-in-one boom works at top efficiency in either conversion.

KOEHRING COMPANY, *Milwaukee 10, Wis.*

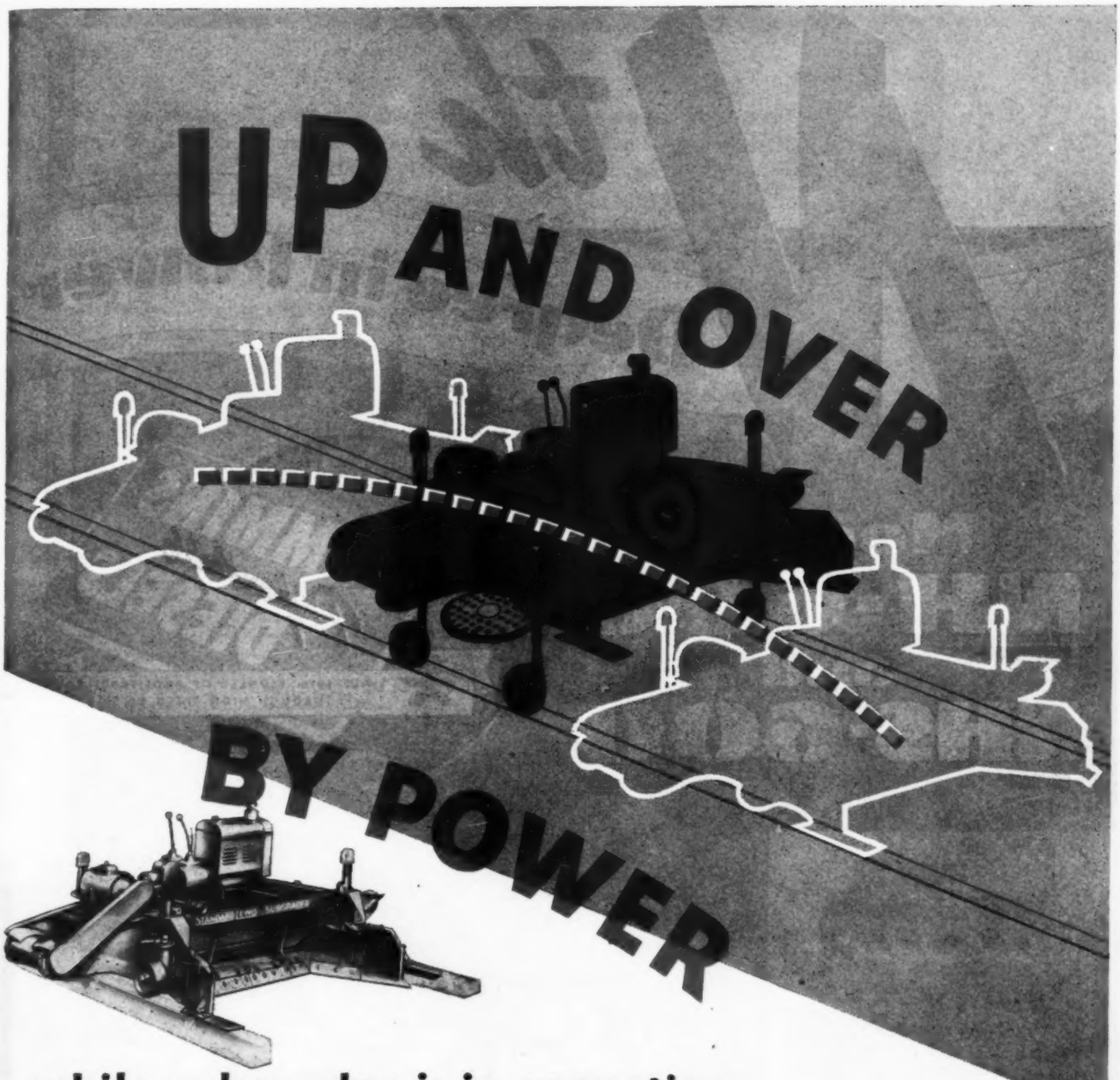
With the new Koehring 205 you can travel, hoist, swing and raise or lower the boom... all at the same time. Contact your Koehring distributor today. Find out how the Koehring 205 fits into your post-war plans.

Orders Accepted NOW For Post-war Delivery..

KOEHRING HEAVY DUTY

ARMY E NAVY

HEAVY-DUTY CONSTRUCTION EQUIPMENT



—while subgrader is in operation

Meet a manhole, culvert, or other obstruction in the subgrade with a STANDARD-LEWIS Subgrader and all you do is throw a single hand lever forward (while subgrader is in operation) and up it goes quickly to clear the obstruction. A simple, balanced cable hoist does the trick in a matter of seconds! This and many other exclusive features (some patented) makes the STANDARD-LEWIS Subgrader a "must" for the tremendous road building programs that are shaping up.

But get the whole story of this really amazing machine. Send now for the new 8-page folder.

OTHER STANDARD PRODUCTS

ASPHALT PLANTS • BATCHING PLANTS • ASPHALT FINISHERS
CONCRETE FINISHERS • LOADERS • ROLLERS • POWER BROOMS

STANDARD
STEEL CORPORATION

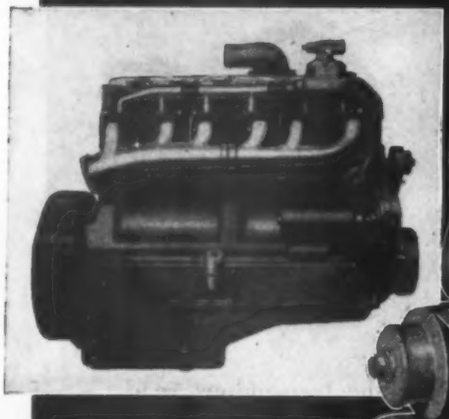
General Offices and Plant: 5001 South Boyle Avenue
Los Angeles 11, California
Distributors Throughout United States and Canada

Nth Degree in Power

Models NH-600 and NHS-600

CUMMINS Diesel DIESELS

SINCE 1918...PIONEER OF PROFITABLE POWER THROUGH HIGH SPEED DIESELS



200 hp.

Model NH-600, 200 hp. at 2100 rpm. (maximum). Designed for heavy-duty automotive, industrial and marine service. For specifications, see table on opposite page.

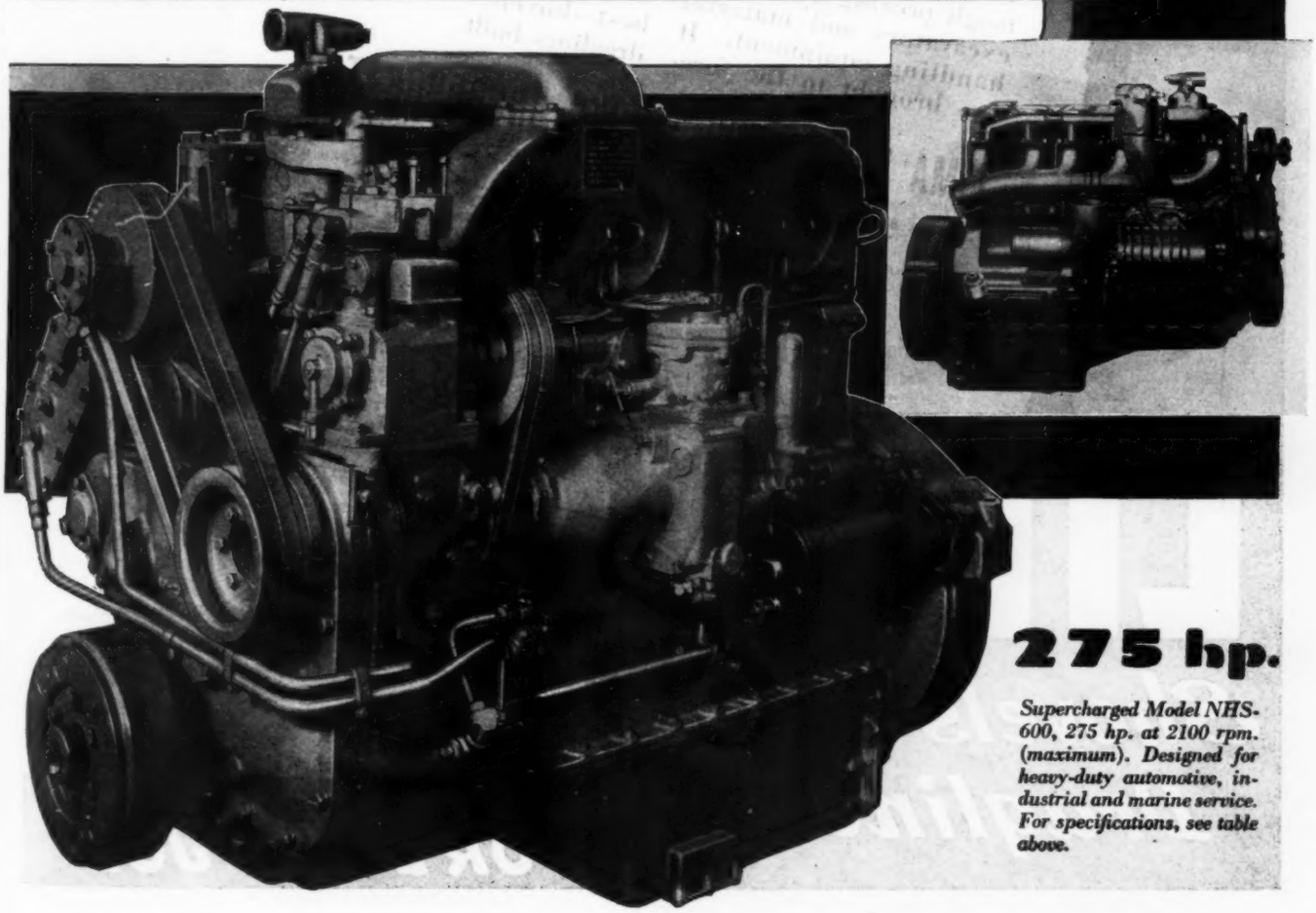
Combining "something old and something new," Cummins—builder of the *original* high speed diesel—now introduces two additions to the line of Cummins Dependable Diesels: Models NH-600 and NHS-600.

The "something old" is the basic design of the well-known Model H Cummins Diesel . . . a design proved sound by a 12-year demonstration of low-cost, dependable performance in all types of heavy-duty applications.

The "something new" in NH and NHS Cummins Diesels includes dual intake and exhaust valves, higher rpm., larger piston displacement and many other refinements that will give you "more power per pound" and the Nth degree in power efficiency . . . that will assure increased payloads and higher profits on your *tough* jobs—automotive, industrial or marine. A comprehensive brochure containing complete specifications and engineering data on Series NH and NHS Cummins Dependable Diesels is now available. Write for your copy of Bulletin 5206-20 today. CUMMINS ENGINE COMPANY, INC., Columbus, Indiana.

Model	No. of Cyl.	Bore and Stroke	Displacement (cu. in.)	HP. (Maximum)	RPM. (Maximum)	*Weight	Weight per Horsepower	*Dimensions
H	6	4⅞" x 6"	672	150	1800	2165	14.43	57⅜" x 46 ½" x 30¼"
HS	6	4⅞" x 6"	672	200	1800	2580	12.9	58½" x 46 ⅜" x 29⅜"
NH	6	5⅛" x 6"	743	200	2100	2500	12.5	58¾" x 49 ⅜" x 28⅞"
NHS	6	5⅛" x 6"	743	275	2100	2850	10.36	60¾" x 48⅛" x 32⅜"

*Weights and dimensions are for engine as designed for automotive application (as illustrated) and will vary with units designed for industrial and marine service. Weights are based on minimum use of light weight materials.



275 hp.

Supercharged Model NHS-600, 275 hp. at 2100 rpm. (maximum). Designed for heavy-duty automotive, industrial and marine service. For specifications, see table above.

After VICTORY

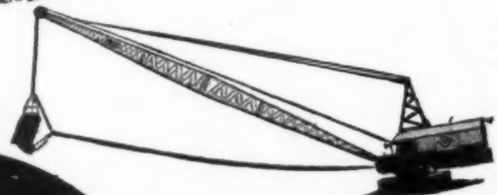
We enter the new year with a profound feeling that Victory is not far away—that soon LIMA Shovels, Cranes and Draglines will be coming off the assembly lines ear-marked for peacetime operation.

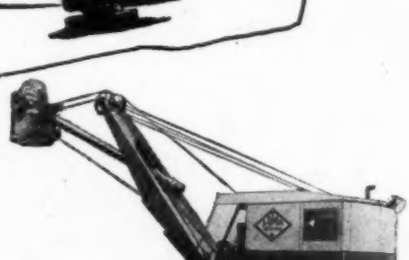
When peacetime comes LIMA will have a line of Shovels, Cranes and Draglines that will be especially designed and built for the big jobs that you have planned for the future. This war has provided a tough proving ground for excavators and material handling equipment. It has brought to the forefront the ruggedness and dependability of LIMA-MADE equipment, built to perform under extreme pressure. As their wartime task continues, LIMA engineers continue to make improvements in design and construction that you may have, after Victory, the best shovels, cranes and draglines built.

LIMA LOCOMOTIVE WORKS, INCORPORATED

Shovel and Crane Division — LIMA, OHIO, U. S. A.

NEW YORK, N. Y. · PHILADELPHIA, PA. · MEMPHIS, TENN. · ST. LOUIS, MO. · NEWARK, N. J.
DALLAS, TEXAS · SEATTLE, WASH. · SAN FRANCISCO, CALIF. · LOS ANGELES, CALIF. · SPOKANE, WASH.
PORTLAND, ORE. · MINNEAPOLIS, MINN. · MONTREAL, QUEBEC, CANADA · VANCOUVER, B. C.





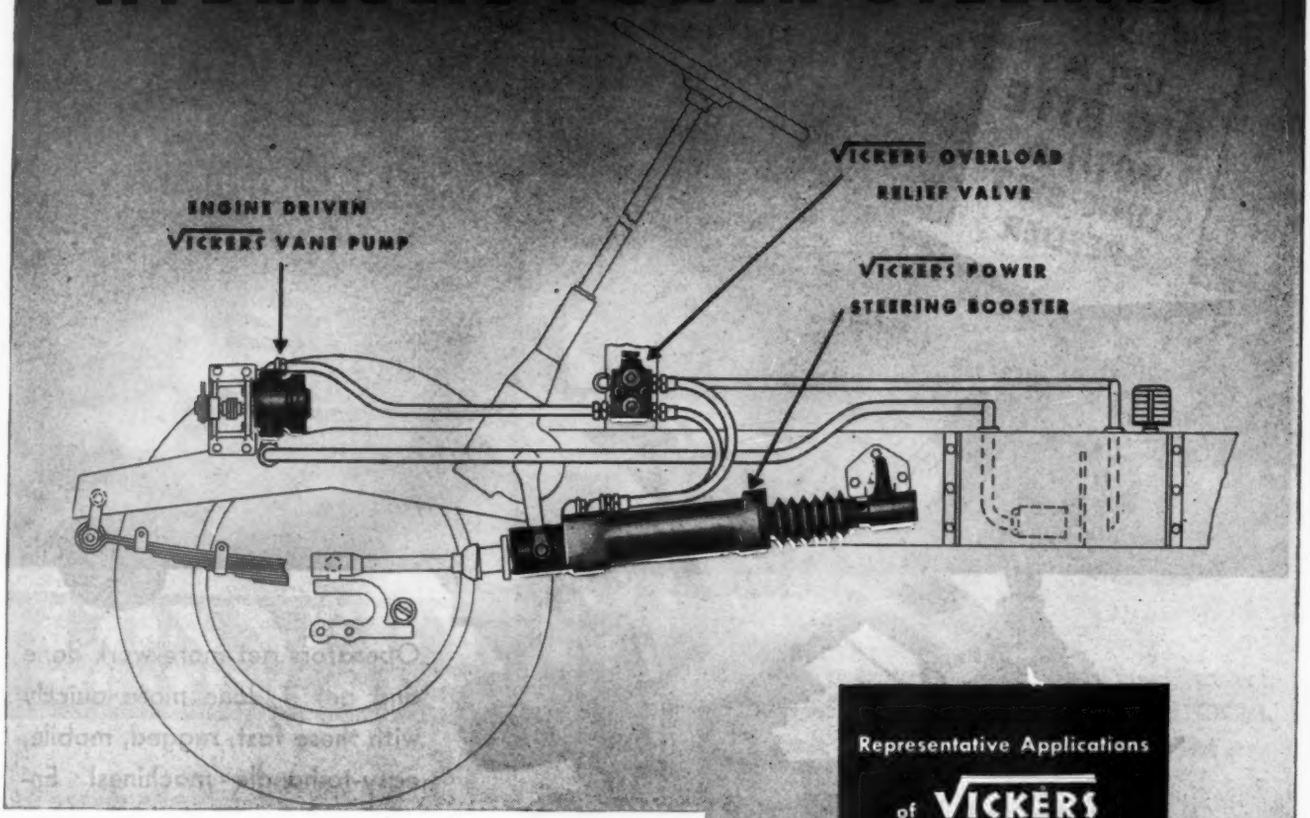
LIMA

Shovels-Cranes
Draglines

A Type and Size FOR EVERY JOB

COMPACT.

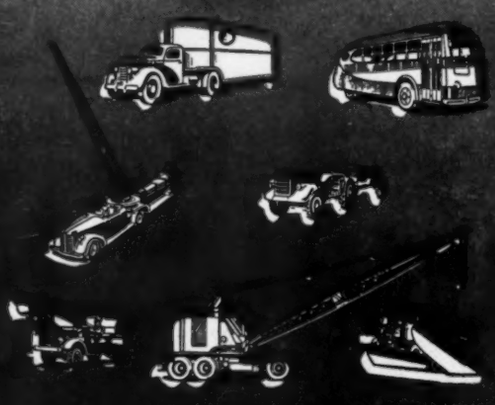
Another Important Advantage of VICKERS HYDRAULIC POWER STEERING



Requiring only a minimum of space for installation, the Vickers Hydraulic Power Steering System can be applied to most existing hand steering mechanisms with a few simple alterations. The separate power cylinder (booster) can be located where it does not interfere with other apparatus and where the power will be applied directly to (and in line with) the drag link. No additional space is required at the end of the steering column where space is usually at a premium.

Other important advantages of Vickers Hydraulic Power Steering are: effortless, positive and shockless steering . . . road shock thrusts are transmitted to the frame of the vehicle instead of to the steering gear . . . automatic overload protection . . . reduced operator fatigue . . . greater road safety . . . automatic lubrication . . . and 15 years of successful operating experience. Bulletin 44-30 gives complete information about Vickers Hydraulic Power Steering; write for a copy.

Representative Applications of VICKERS HYDRAULIC POWER STEERING



VICKERS *Incorporated*

1400 OAKMAN BLVD. • DETROIT 32, MICHIGAN

Application Engineering Offices: CHICAGO • CINCINNATI • CLEVELAND • DETROIT LOS ANGELES • NEWARK • PHILADELPHIA • ROCHESTER • ROCKFORD TULSA • WORCESTER

TO KEEP UP WITH A LINK-BELT SPEEDER

TRUCKS MUST MOVE FAST!

Operators get more work done and get it done more quickly with these fast, rugged, mobile, easy-to-handle machines! Engineered for trouble-free service—these machines can take the toughest grind and stay in there pitching day-in day-out under all conditions.

For Prompt, Efficient, Convenient Sales and Service There Is a Link-Belt Speeder Distributor Located Near You

9771

LINK-BELT SPEEDER

Builders of the Most Complete Line of
SHOVELS-CRANES-DRAGLINES

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.
(A DIVISION OF LINK-BELT COMPANY)

SO LONG AS THE ENEMY RESISTS

the BYERS shovel we'd like to ship you is helping break down that resistance for you

In the meantime, owners of current and older models of Byers shovels and cranes may depend on Byers Parts Service to help them keep present equipment working steadily and satisfactorily.

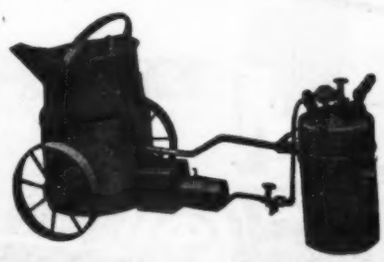
For crawler, truck mounted or self-propelled models of shovels and cranes in the portable sizes, see your nearby Byers distributor.

BYERS CRANES AND SHOVELS
RAVENNA, OHIO
DISTRIBUTORS THROUGHOUT THE WORLD

CONNERY'S HEATING KETTLE

For speedy heating of tar and asphalt—

Use this CONNERY oil-burning Patrol Patching Heater on the *small* job and this CONNERY oil-burning kettle for *large-quantity* production.



Write for catalog showing our full line of tar and asphalt heating kettles, spraying attachments, pouring sets, etc.

CONNERY CONSTRUCTION Co.
3900 North Second St. Philadelphia, Pa.

Take a trip through a

BRIGGS FULLERS EARTH CARTRIDGE

You'll see why this patented cartridge keeps oil "REFINERY PURE"

DIRTY OIL enters here—passes through outer layer of cellulose where it is FILTERED. Insoluble particles — metal chips, dirt, carbon, dust—are removed by ABsorption.
FILTERED OIL enters patented molded Fullers Earth where it is PURIFIED. Soluble impurities—gums, acids, resins that cause engine deterioration—are removed by ADsorption.
FILTERED AND PURIFIED OIL enters inner layer of cellulose where is is CLARIFIED. Insoluble impurities as small as 1 micron (.00004") are removed by ABsorption.
OIL HAS NOW BEEN CLEANED 3 TIMES—3 WAYS a process offered only by Briggs Fullers Earth Type Clarifiers.

In addition to patented Fullers Earth Type Clarifiers, Briggs offers for users of additive-type oils the DISCEL (All-Cellulose) Cartridge—specially-designed and constructed to remove insoluble impurities.

Using these two types of refill cartridges—Briggs offers operators of every size and type internal combustion engine the advantages of effective oil filtration.

To help you secure this profit-producing, equipment-saving method of oil filtration, Briggs distributors are located in all principal cities. They are equipped to study your oil filtration problem and give you expert advice and recommendations. Consult the classified section of your phone book under "FILTERS" or write manufacturer for complete information.

Briggs
PIONEERS IN MODERN OIL FILTRATION

BRIGGS CLARIFIER COMPANY
GENERAL OFFICES, WASHINGTON 7, D. C.
DISTRIBUTORS IN PRINCIPAL CITIES

Fruehauf Carryalls—are built to "Take it." They make light work of heavy hauling regardless of the size of the job.

Above—Fruehauf Gravel Dump Models —handle deliveries with speed and economy for the operator.

Crushed Stone Dumps—provide rugged construction to handle heavy loads.

Left—Hopper Trailer "Trains"—speed construction work and cut costs.

Specially designed for tar-asphalt hauling—but used for general dump and construction work.

Ready-Mix Trailer — engineered to transport concrete direct to the road-building job.

Bulk Cement Haul Trailers—are fully enclosed—provide an even flow of cement—faster delivery and protection to the material.

Name the Job!

A TRUCK IS LIKE A HORSE

Fruehauf Engineers Design the Correct Trailer to Handle It!

• Every hauling problem is handled by Fruehauf engineers as an individual problem. Fruehauf Trailers are *designed* to your exact requirements. The Trailer you need may have 4 tires or 24 tires . . . with any one of many wheel and axle combinations—any width or length to carry most any kind of load or equipment. You'll find the applications to individual needs are endless at Fruehauf.

Today is not too soon to consult with us on getting the design of your postwar Trailer through the blue-print stage —ready for the production go-ahead. This costs you nothing extra—yet it may save much valuable time later on.

World's Largest Builders of Truck-Trailers

FRUEHAUF TRAILER COMPANY, DETROIT

Service in Principal Cities

Fruehauf Trailers "ENGINEERED TRANSPORTATION" REG. U. S. PAT. OFF.

BLACKHAWK HYDRAULIC CONTROLS BRING

a Real Sense of Security

TO THE MEN BEHIND THE PLOWS

BUCKING the drifts, *cold miles from nowhere*—is like making a bombing run over an enemy target. *Every part of your equipment must work!*

The importance of the Hydraulic Controls ranks next to the continued functioning of the truck itself. And, it's no accident that Blackhawk Hydraulic Controls are the most universally used. They're specified because of their service-proved dependability, performance and freedom from maintenance. Nine out of ten snow-plow makers furnish Blackhawk Controls.

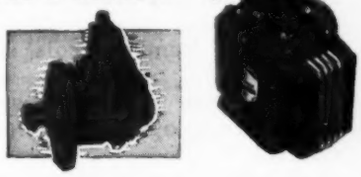
The vast majority of road men *specify* Blackhawk Hydraulic Controls, because they want and deserve the *extra security* which these sturdy pumps, rams, and valves bring to them.

FOR CHANGE-OVER of cumbersome, rust-jammed mechanical controls to smooth Blackhawk Hydraulics — contact your plow manufacturer. Hand-operated or power-driven Blackhawk pumps — controlled from the comfort of your warm cab — can be scheduled for delivery through the maker of your plows. Dependable Blackhawk valves and rams are also being produced in wartime for assurance that "The Men Behind The Plows" can continue to do their important job.

A product of **BLACKHAWK MFG. CO.** Dept. RS, **Milwaukee 1, Wis.**

90% **OF ALL SNOW PLOW MANUFACTURERS USE THESE CONTROLS**

Hand-operated, or Power-Driven Blackhawk Hydraulic Controls are installed at the factory by the vast majority of snow-plow manufacturers. When buying new road equipment, always specify Blackhawk Hydraulic Controls. Ask your road machinery manufacturer—or write to Blackhawk.



BLACKHAWK

Hydraulic Equipment

Here's Why

Jahn Trailers

have faster, smoother braking action

They're equipped with hydraulic brakes which provide the same efficient and safe hydraulic braking action used on trucks and pleasure cars. This new application which was perfected by Jahn engineers assures positive, equal brake pressure on all wheels and consequently smoother, faster braking action. Even when trailers are travelling over very rough terrain there's no possibility of partial application or dragging of the brakes. Safety is increased and maintenance simplified.

Jahn heavy duty trailers are offered in a wide range of sizes from 5 to 100 tons with any axle or wheel combination. Every detail is fabricated with such extreme care and skill that no Jahn trailer has ever failed from carrying its rated capacity load. For the answer to all your heavy duty trailer problems come to "Trailer Headquarters."

C. R. Jahn Company, 1345 W. 37th Place
Chicago

Any Axle or Wheel Combination

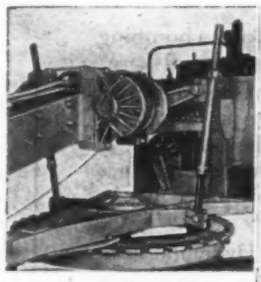
JAHN *Heavy Duty* TRAILERS
Capacities from 5 to 100 TONS

"COME TO TRAILER HEADQUARTERS"

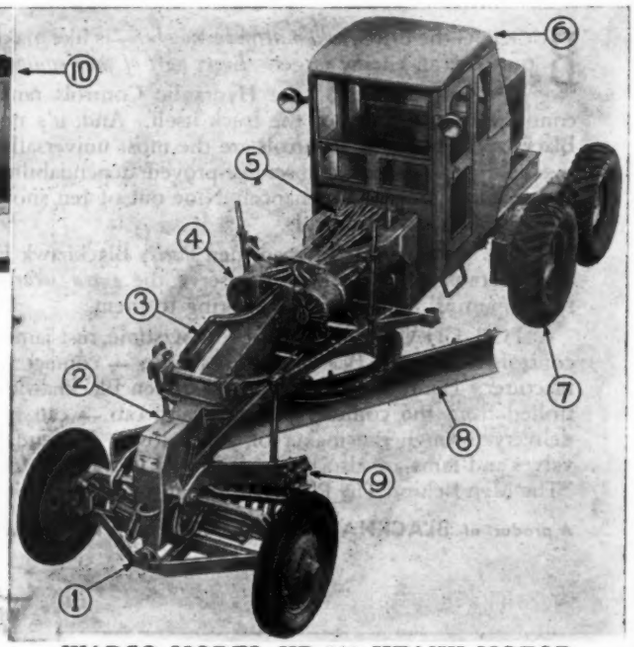
TAKE A LOOK AT A

WARCO

HYDRAULIC CONTROL MOTOR GRADER



1. Heavily reinforced solid steel bar front axle is steady driving.
2. Rugged, single-member frame of welded construction.
3. Hydraulic Ram controls scarifier or snow plow.
4. Four simple Hydromotors operate heavy blade from operator's station, with easy control.
5. Hydraulic lines in orderly arrangement and thoroughly accessible.
6. De luxe steel cab. Full, clear vision through safety glass. Insulated roof.
7. WARCO Tandem has chain drive. Hydraulic brakes on two or four wheels. Parking brake on transmission.
8. Heavy moldboard is adjustably mounted and operable in either direction of travel. Blade stays in position where operator wants it.
9. Husky V-Type Scarifier. Teeth individually removable.



WARCO MODEL VD-140 HEAVY MOTOR GRADER

10. Four Hydromotors operate by oil pressure with smooth, senstive rotary action, for placing blade in any practical position.

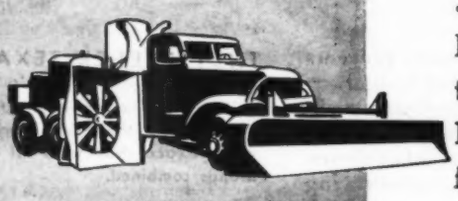
HERCULES ROLLERS — LIGHT MAINTAINERS — HYDRAULIC SCOOPS — MULTIPLE BLADE MAINTAINERS — TERRACING GRADERS — ROTARY SCRAPERS

W. A. RIDDELL CORPORATION, Bucyrus, Ohio

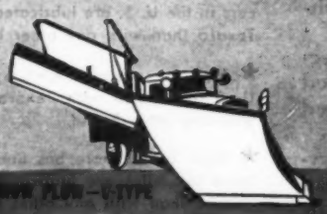
BROS *Sno-Flyr* PLOWS

A TYPE AND SIZE FOR EVERY JOB REQUIREMENT

SNOW PLOW—ROTARY



SNOW PLOW—WIDENER



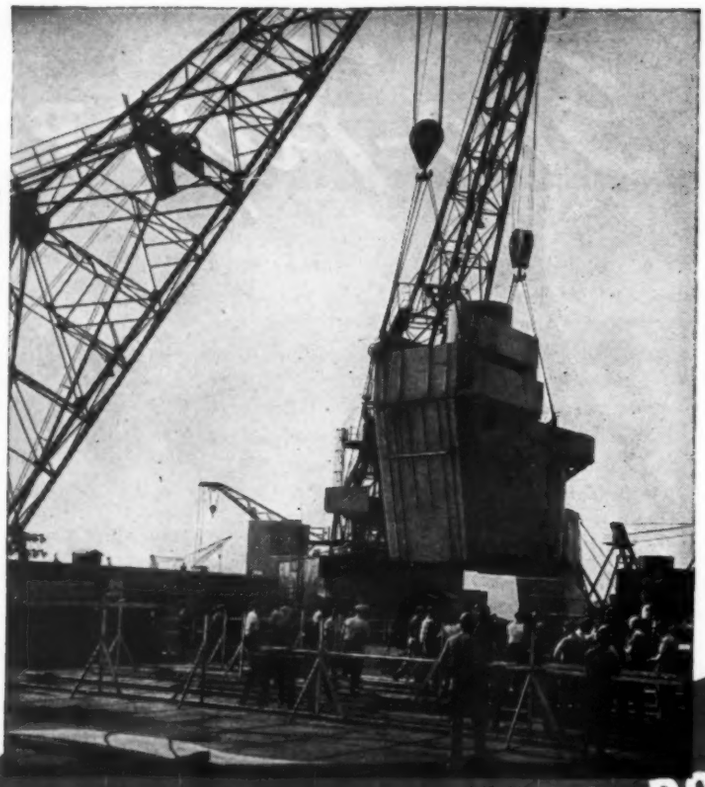
SNOW PLOW—V-TYPE

BROS designs and manufactures a complete line of "Sno-Flyr" plows. Big giant Rotaries for the toughest kinds of snow jobs—the sensational Bros Rotary-Widener for airport clearance and for widening roads by removal of snow banks from road shoulders—and the popular line of Bros V type and mouldboard plows.

Complete information promptly furnished. Write today for detailed literature.

Wm. Bros Boiler & Mfg. Co., Minneapolis, Minn.

BROS *Snow* PLOWS



SWINGING AN "ISLAND" INTO POSITION

IN perfect coordination, two giant 75-ton capacity cranes slowly swing into position the 105-ton after-section of the flight deck island on the new aircraft carrier "Antietam"—an operation that requires maximum team-work from crane operators and maximum efficiency from wire rope.

To get the most efficient service out of wire rope—on projects large and small—it must be thoroughly protected from the destructive effects of wear and weather. And to experienced contractors everywhere, this means lubrication with *Texaco Crater*.

Texaco Crater penetrates into and preserves the core of wire rope, preventing collapse. It seals each wire in a tough viscous film that reduces internal friction and wear, keeps out moisture, prevents corrosion. Keeps rope strong longer.

Used on open gears, *Texaco Crater* cushions load shocks, quiets noise, reduces wear. It doesn't ball up, channel or throw off, but clings to tooth surfaces, following through from gear to gear, despite high pressures and temperatures, and peripheral speeds.

Texaco lubricants have proved so effective in service they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available to you through more than 2300 Texaco distributing points in the 48 States.

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

★ More Diesel horsepower on streamlined trains in the U. S. is lubricated with Texaco than with all other brands combined.

★ More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.

★ More revenue airline miles in the U. S. are flown with Texaco than with any other brand.

★ More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.

★ More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON SUNDAY NIGHTS ★ METROPOLITAN OPERA BROADCASTS SATURDAY AFTERNOONS

ROADS AND STREETS

January, 1945, Vol. 88, No. 1

CAA Airport at Martinsburg

Ragged rock outcroppings hampered Lane Construction Company on $933,000 contract

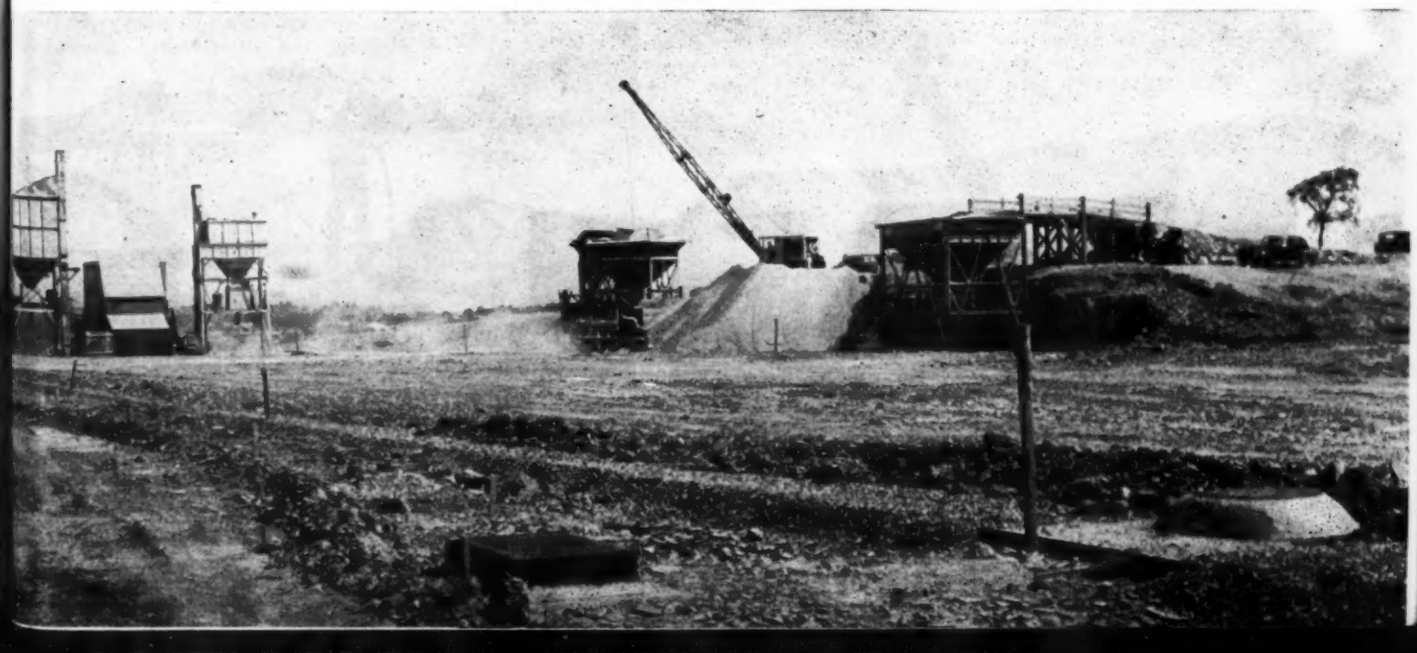
AN example of the perennial trickiness of hidden rock was furnished on Lane Construction Co.'s CAA airport job at Martinsburg, W. Va., this past season. Even though numerous test pits and borings were taken, the percentage of rock encountered in excavating for the runways was much higher than anticipated, because of irregularities in rock contour. In fact, a great variety of materials from gumbo clay through various forms of shale to limestone ledge were encountered in such irregular strata that the work from day to day presented various grading difficulties. Several test pits were centered over submerged pot-holes, falsely indicating heavy earth cover.

The 765,000 cu. yd. of unclassified excavation finally ran about 50 per cent rock and shale. One 400-ft. length of runway required removal of 100,000 cu. yd. of rock, mostly in the form of irregular out-croppings that stopped or slowed up pan work. As high as ten compressors powering jackhammers and wagon drills were kept busy in one spot for several weeks. A 1¼-yd. shovel loaded to bottom-dump wagons, aided by a heavy bulldozer which nosed big chunks out of the way and pushed scattered rock to within reach of the dipper.

On runway grading the Lane outfit did a nice job of "cleaning up as they went." No stripping at toes, or other straggling clean-up work except where rock complicated the job. Where rock didn't interfere, 7 to 1 cut slopes were dressed close behind or alongside grade compaction, first using scrapers to bring down, then blades traveling along the slopes. Obtaining subgrade compaction density was aided by systematic dispersion of dump wagons, scrapers and other rubber tired equipment. The standard crowned contour was carefully maintained as the fills came up, and blades were kept busy ironing out any well-defined paths formed by hauling units. Cuts and fills ranged up to about 10 ft. max.

An outfit comprising 5 scrapers (8 to 12 yd.), 3 graders, 3 sheepsfoot dual drum rollers, 3 three-wheel rollers, 5 shovels (¾ to 2 yd.), 9 self-powered 12-yd. bottom dump wagons, 10 rock body trucks and 7 dozers moved as high as 12,000 cu. yd. of

Lane's batch plant included two cement bins of 650 bbl. combined storage capacity (left), a double bin for 2 stone sizes (center), and sand and a 150-ton bin for stone dust used together with sand as small aggregate (right). The layout took advantage of a ledge which was subsequently cut down as part of a 7 to 1 slope. Note gravel drain in place along location of pavement edge in foreground



Bottom and rear dump units carried rock away from a 1¼-yd. shovel on outcroppings. The dozer moved stone as far as 150 ft. to the shovel

As high as 10 compressors played nursemaid to a crew of jackhammer and wagon drill operators to remove irregular outcroppings

A power form grader performed the work of several non-existent men. Note modern grease truck, which did most of its work at night after the second shift

earth per 16-hr. day, but slowed down to 2,000 cu. yd. in rock areas.

Drain Lines Blasted and Rooted

Progress on the ditching for 34,000 lin. ft. of drain lines also became an unpredictable job due to rock. Considerable ditch footage had to go down into rock or very hard shale, although the largest portion of pipe trenches where shale was encountered was broken up with rooters. One stretch half the length of a runway was trenched through earth in half a day. Similar area in rock took 8 days. A back hoe handled all trench excavation, aided by 3 to 10 men picking up blasted rock. The large concrete pipe was set with a wide crane on a tractor.

Since the width of trenches in hard shale where blasting was required could not be controlled accurately, the contractor poured granular backfill in wooden side forms, back filling outside the forms with earth as forms were drawn out by a lifting crane. This was an important detail with the contractor, since he was paid $5.00 a cu. yd. for a porous backfilled ditch to dimensions 3 in. outside the drain pipe, and any excess width was "on him."

The joints of "open joint" pipe drains were grout sealed around and slightly above the lower half; and strips of tar paper laid on joints before backfilling. All field drains were completely grouted. Extra care was taken to properly backfill granular-filled drain trenches. Material was compacted in 8-in. lifts using pneumatic hand tampers and field tests were run on stone gradation.

Berm Construction

Specifications called for a berm 2 ft. high and 3 ft. wide at the top

(Left): A pull shovel performed most of the 34,000 lin. ft. of trenching, much of which also involved blasting. (Right): Porous backfill for drain lines and backfill of drainage structures was packed in 8-in. lifts with pneumatic tampers

(Left): Blowing out pavement joints with compressed air. (Right): Sealing joints

along the edges of fill slopes, to prevent surface washing. This berm was dressed by a motor grader which traveled along the outside shoulder and was held in position by an anchor line to a heavy dozer running ahead along the flat grade inside the berm. The scraper moved dirt under its own power.

Lane Sequence in Runway Paving

Concrete runways and taxiways were of uniform 8-in. thickness, with gutters along the outer runway lanes.

Placement of 178,000 sq. yd. of runways, located in a cross-shaped layout, was expedited by careful advance planning of the path of paver travel. Each runway was built in twelve 12½-ft. lanes. The scheme was to begin with a lane next to the center-line, come back on the other side of the center, and keep circling in alternate directions, working outward, so that the left side of finishing equipment always rode the forms. One center lane was completed on each runway and along the principal taxiway, then two 27-E paving crews went to work, one on each runway, leaving 50-ft. gaps at the intersection for passage of grading equipment and batch trucks.

Concrete finishing equipment consisted of a double screed finishing machine, two spud vibrators to be used along the edges of the forms, a mechanical longitudinal bull float, a longitudinal wood float or darby, a long handled wood float, a 16-ft. straightedge and a burlap drag.

Spreading Concrete

The hand labor of spreading a stiff paving mix was reduced and the work of the mechanical finishing speeded by means of a heavy strike-off. The screed consisted of a 6"x12" timber dragged along the forms by means of cables which lead to an I-beam projecting over the subgrade from the paver and thence through sheaves to a winch drum built into the paver mechanism. Because of the weight of this

J. E. Cowles, project engineer for CAA, and G. D. Helmer, sup't for Lane Constr. Co.

strike-off, a "home-made" dolly mounted on two pneumatic wheels was used to transport it as necessary. A considerable labor saving is effected as two or three men can move the screed once it is mounted on the dolly by the spreading gang.*

Problems Presented by Gutter Sections

The most serious paving problem was presented by the fact that the gutter sections were entirely within the outer 12½-ft. pavement lanes and that the gutter sections were lost in long transitions on approaching runway and taxiway intersections. The Lane Construction Co. met this problem by rebuilding both their double screed and longitudinal finishing machines. The screeds on the transverse finishing machine were hung on bolts so as to be adjustable, while the tracks on which the longitudinal screed, rather than the screed itself, were changed to give the necessary section by movement of adjusting nuts spaced along the tracks.

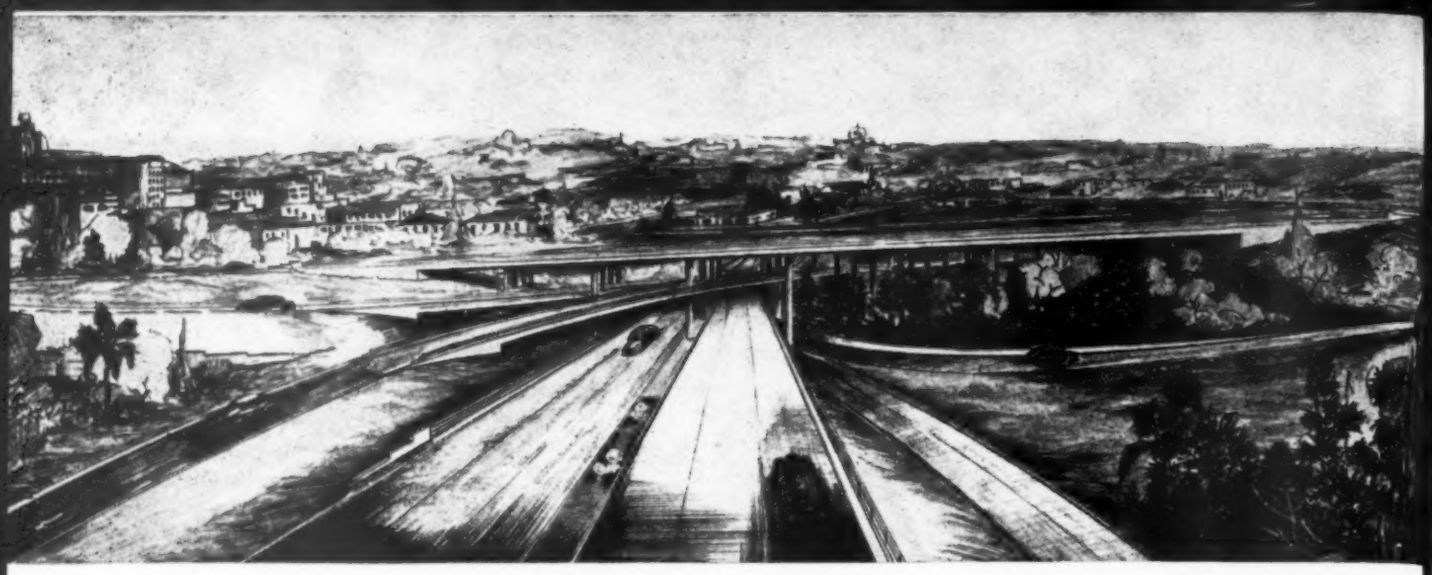
No broom finish was used following the burlap drag as it was desired to obtain as smooth a finish as possible in order to conserve airplane tires. Curing was done by a commercial curing compound, machine sprayed and following the dragging operation as closely as possible.

All joints were cleaned by compressed air and painted with emulsion before being sealed. The sealing was done by a standard machine slightly modified by the Lane Co. for greater efficiency.

J. E. Cowles was resident engineer on the Martinsburg airport, which was designed and supervised by the New York regional office of Civil Aeronautics Administration. G. D. Helmer was superintendent for Lane Construction Co., of Meriden, Conn.

*"Roads and Streets," Oct., 1944, p. 67, carried a brief account of Lane Co.'s screed.

Using a hand pump outfit, moisture was sprayed on the concrete just ahead of the final burlap drag on hot days where necessary to remove float marks and assure a smooth finish. Concrete was internally vibrated with a bullnose ahead of the finisher



Proposed 4-level interchange at junction of Hollywood and Arroyo Seco Parkways, which will carry a load of 75,000 to 200,000 vehicles daily to and from the four directions

New Parkways for Los Angeles Taking Form

Details are well along on two major axial expressways for the Los Angeles Metropolitan area. Many design innovations; unprecedented traffic concentration to be handled

It would be expected that sprawling Los Angeles, the most "automobilized" area in the world, with nearly 1,300,000 cars, trucks and trailers (1941 county registration), should be the scene of really spectacular post-war expressway development. Such a project, "colossal" in aspect but soundly planned, is on the drafting boards—is in fact so far advanced that 10 miles of freeway could be advertised for bids almost any time. Here are some of the details.

By HAROLD J. McKEEVER
Editor, Roads and Streets

A SYSTEM of parkways for the metropolitan area of Los Angeles has been under consideration for several years, and much intensive study has been given to traffic needs, economic aspects, route selection and more recently to design details. The location of several major arteries has been definitely fixed. The more important parkways are on the state system and will serve inter-city and through-city as well as local "cross-town" and inter-neighborhood traffic.

While much planning work has been done by the Los Angeles County Regional Planning Commission, and other local agencies, development of designs and construction plans of the parkways on the state highway system is a final responsibility of the State Division of Highways. The Division has been engaged for some time in location and design studies, in cooperation with the Los Angeles City Engineering Department.

The parkways fit in with the Los Angeles Major Street Plan. As a bit of background, the Regional Planning Commission of Los Angeles County in 1940 undertook, with WPA assistance, a traffic survey to determine the intensity of use of the various major highways of the region. This survey was completed early in 1942 and the data collected were compiled and a series of maps prepared to show the results.

Fig. 1 shows the traffic load from which plans were prepared for a freeway system to serve the region. As a part of the same study, origin-destination data were secured for about 300,000 vehicles engaged in regular daily movement throughout the county. These data made possible an evaluation of the through or long-haul traffic which could make efficient use of freeways in various locations. Several plans have been prepared in the past for such a system, but due to a changing land-use pattern certain additional freeways became necessary as well as variation in location of previously proposed freeways.

With all of the former plans in mind and a new picture of the need, the County Planning Commission prepared a general scheme to crystallize the pattern and stimulate thought toward actual accomplishment.

Need for Freeways

In the year preceding Pearl Harbor 1,300,000 motor vehicles were registered in Los Angeles county. The money spent for gas, oil, tires, and repairs on these vehicles, figured at 2 cents per vehicle-mile, amounted normally to more than $200,000,000 per year.

There were then in the county some 13,000 miles of streets and highways, representing an investment of $600,000,000 for acquisition and construction, and costing $10,000,000 annually for improvement, maintenance, and upkeep.

The county's vehicles traveled 10½ *billion* miles per year on these highways, at a general average speed of 15 mph. Traffic accidents in the county in 1941 took a toll of 1,103 lives and 29,740 injured.

Experience elsewhere in the United States, as well as in Europe, has indicated that the new supplementary system should be what is termed a freeway, parkway or express-highway system. These three types are similar in that they all permit the safe, uninterrupted flow of traffic. It must be understood that this freeway system will *not* replace the highway system,

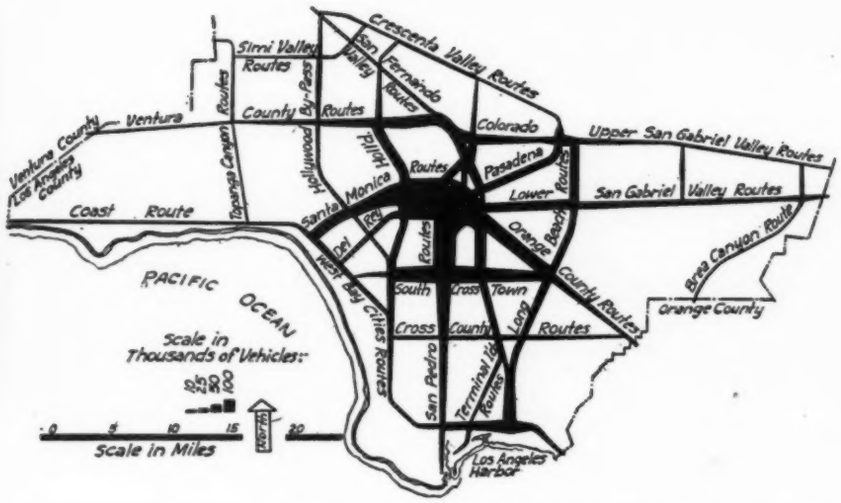


Fig. 1. Graphic analysis of 1941 traffic flow on which first-priority parkway locations were based

but will make it work better. Through movements, upon the freeways, will not be stopped or slowed by local traffic. The ordinary highways, in turn, will then be relieved of much through travel and can handle more safely movement of the local, short-haul traffic for which they are suited.

Realizing that the cost of a complete system of freeways would be prohibitive if constructed at one time, construction was proposed in accordance with a priority schedule. The program of initial development (Fig. 2) shows a system, a portion of which is already completed, namely the Arroyo Seco Parkway connecting Los Angeles and Pasadena, a portion of the Hollywood Parkway through Cahuenga Pass, and a portion of the Ramona Parkway.

Two Major Axes to Carry Huge Flow

Two of the main axes of travel through the Metropolitan area are state routes 2 and 165. This article will deal principally with the details of these routes, as being prepared by the state division of highways, including the unique 4-level grade separation structure proposed at their point of intersection.

State route 2 is one of southern California's most heavily traveled highways, being the main route between San Francisco and San Diego and passing through the heart of Los Angeles. It enters the suburb of Hollywood from the northwest through Cahuenga Pass. This section through Cahuenga Pass for 1½ miles was developed in 1940 as a modern limited access highway.

From Cahuenga Pass in to the Los Angeles Civic Center fringing the downtown shopping district, about 6 miles, the new project is called Hollywood Parkway.

Then under the name Santa Ana Parkway, the route will continue southeast past a junction with Ramona Parkway, at Aliso Viaduct, already partly completed (see ROADS AND STREETS, Sept., 1944), going on via new location to the city of Santa Ana 35 miles distant. About 20 miles of the Parkway will cut through a built-up city area and hence will serve much local as well as long-distance traffic. Plans for Santa Ana Parkway within the city are completed.

State route 165 enters Los Angeles from the northeast, then passes south through some 25 miles of intensively improved city area to the Harbor at San Pedro. Harbor Parkway, this portion is called. The Arroyo Seco-Harbor axis will be a lateral route con-

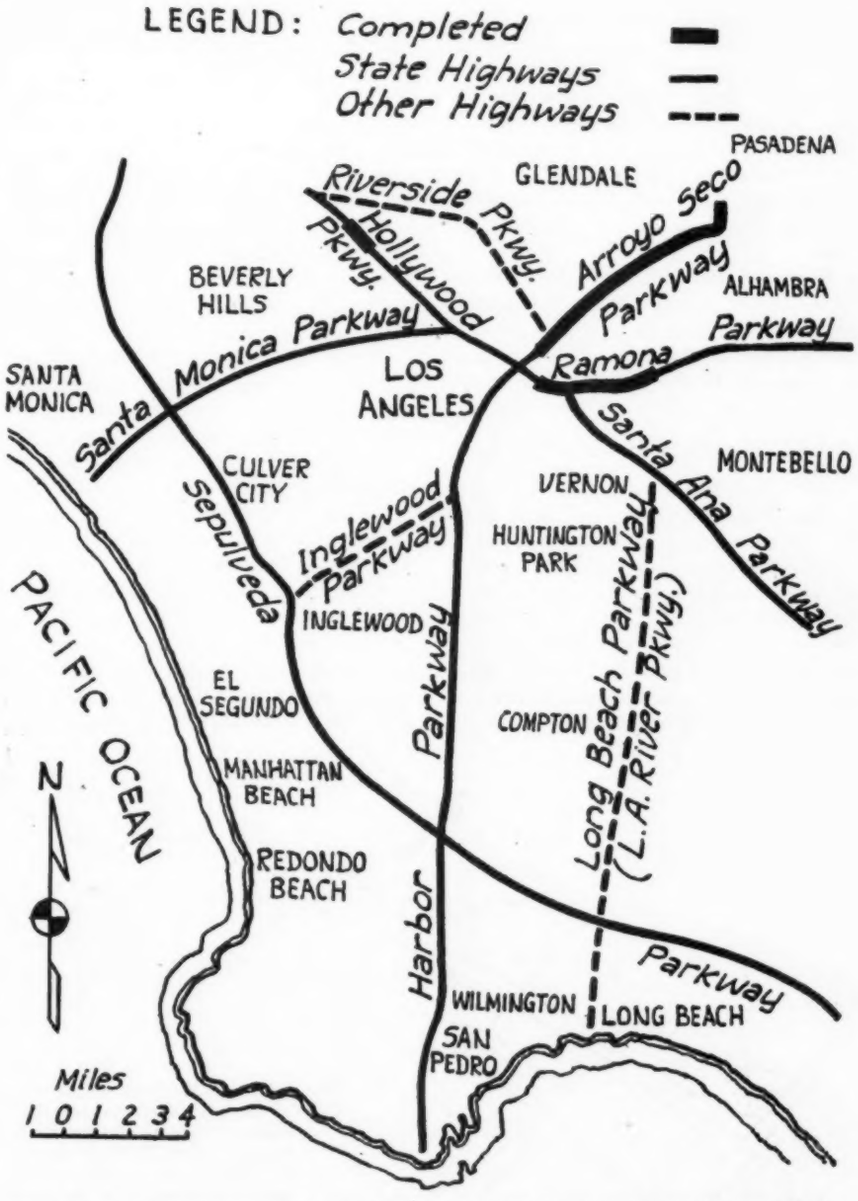
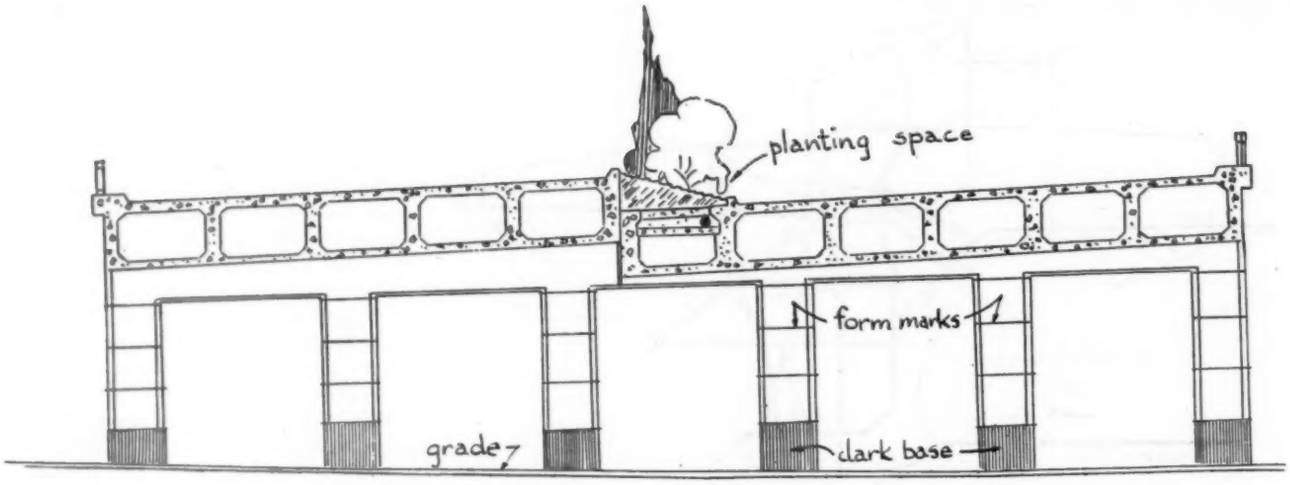


Fig. 2. First-priority freeways will total 200 miles, of which the Arroyo Seco Harbor and the Hollywood-Santa Ana axes represent 70 miles



Preliminary design study of hollow box girder concrete deck (superelevated on curve), showing handling of earth-filled center mall

necting with large cities to the east and west. The Pasadena section, known as Arroyo Seco Parkway, was developed in 1940 as the city's first modern expressway. Whisking 20,000 to 30,000 vehicles daily to the edge of the downtown district over the 7 miles, it has already paid for itself in economic benefits, lives saved and in its influence on urban development. Harbor Parkway is in the design stage.

Routes 2 and 165 represent about 70 miles of freeway within the metropolitan area of which 8 miles were developed before the war. These routes are part of a 200 mile first priority system of freeways shown in Fig. 1.

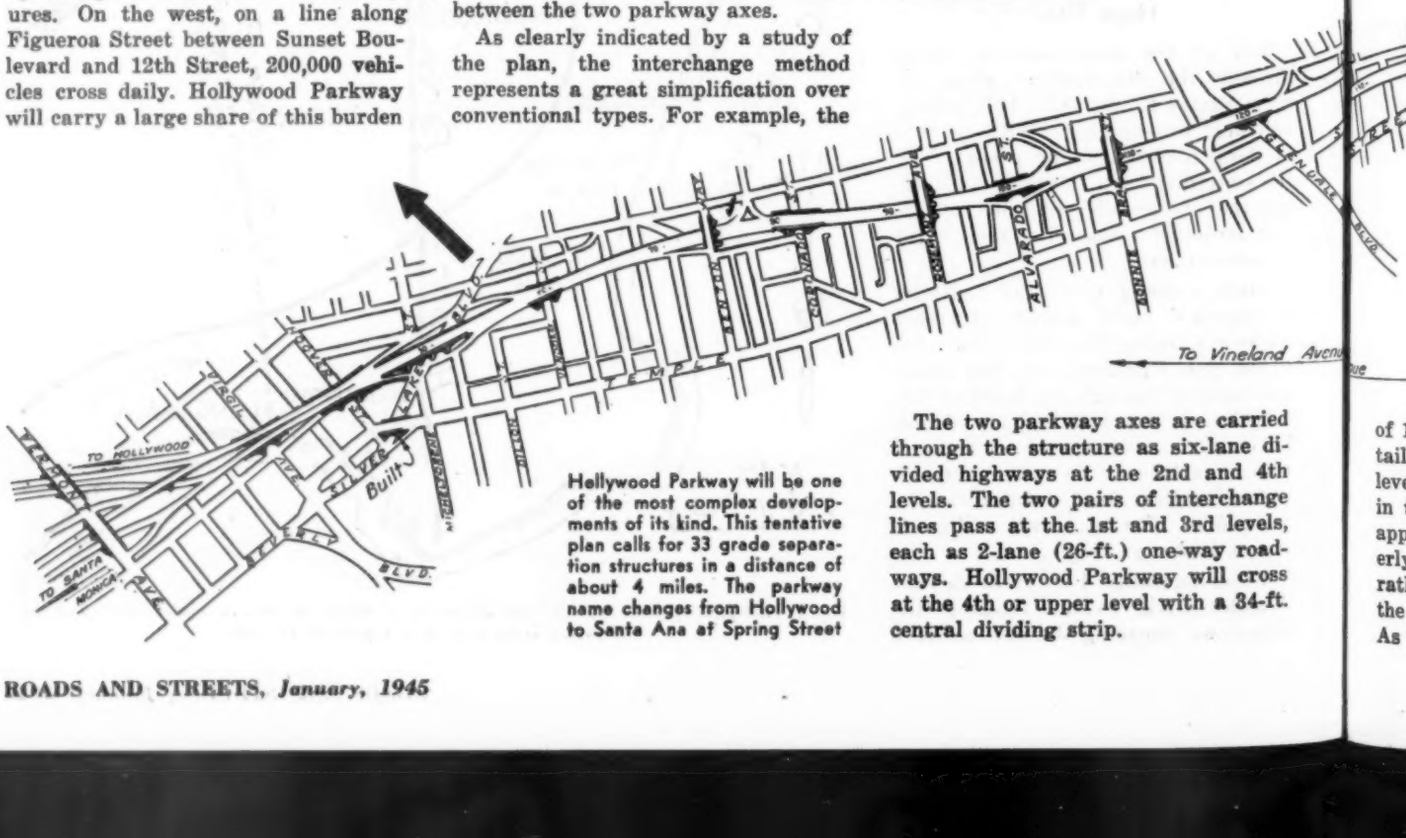
4-Level Grade Separation Planned

Not far from the Civic Center routes 2 and 165 axes will intersect. An interchange problem is created here whose magnitude is best revealed by citing some estimated traffic figures. On the west, on a line along Figueroa Street between Sunset Boulevard and 12th Street, 200,000 vehicles cross daily. Hollywood Parkway will carry a large share of this burden to the interchange structure. About 100,000 daily will come and go from the north, 75,000 from the east and 150,000 from the south. With flows of this magnitude into this area the interchange structure will be doing heavy duty. Saving of a short distance traveled within the interchange becomes of great economic value, and an exhaustive study of layout and structural details is warranted. State and city engineers have given special study to many forms of design in order to provide a final design of utmost efficiency and safety.

The outgrowth of this effort is an entirely new type of grade separation and interchange system, designed to take every advantage of the topographic conditions and requirements of the site. Traffic flows at four levels, in a novel pattern which is believed to offer greatest safety and orderliness while cutting travel distance to a minimum for vehicles interchanging between the two parkway axes.

As clearly indicated by a study of the plan, the interchange method represents a great simplification over conventional types. For example, the clover-leaf type makes traffic loop 270° to the right, and creates an overlap of accelerating and decelerating traffic which is a familiar source of confusion, delay and danger. Other types involve reversing curvature and circuitous travel for some of the traffic, along with numerous bridge structures, to the detriment of smooth, economical operation.

In contrast, all drivers on this 4-level design turn in the direction they wish to go and without having to travel farther than if they were simply on a curved highway. All take-offs from one parkway to another are made on the right. The four separate roadway levels are so arranged as to pass one another at one point within a single bridge structure. The two parkway axes intersect at nearly right angles at separated levels, while two pairs of interchange roadways, at two other levels, each bisect the main parkway quadrants.



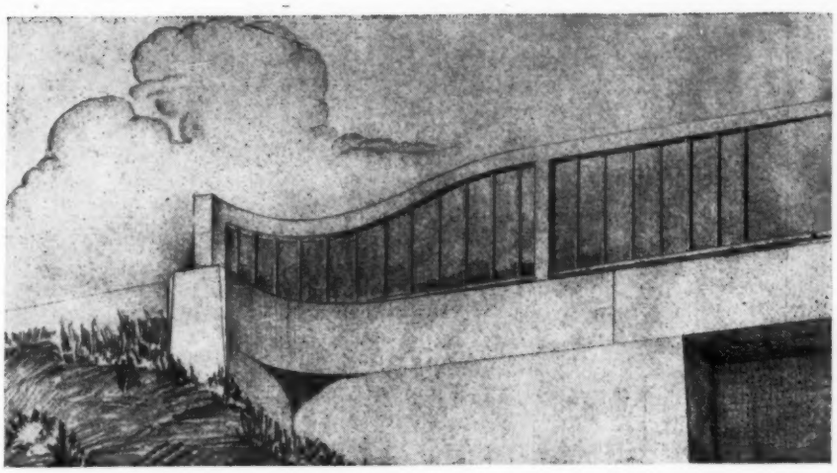
Hollywood Parkway will be one of the most complex developments of its kind. This tentative plan calls for 33 grade separation structures in a distance of about 4 miles. The parkway name changes from Hollywood to Santa Ana at Spring Street

The two parkway axes are carried through the structure as six-lane divided highways at the 2nd and 4th levels. The two pairs of interchange lines pass at the 1st and 3rd levels, each as 2-lane (26-ft.) one-way roadways. Hollywood Parkway will cross at the 4th or upper level with a 34-ft. central dividing strip.

The lowest and highest roadways will have 69 ft. difference in elevation. The structure will extend about 47 ft. above the natural ground surface, the 22-ft. minus elevation being determined by the limit of drainage by gravity into an existing storm system. Advantage was taken of ground contours in planning the structure and roadways. The upper or Hollywood Parkway roadway crosses on a supported grade with a smooth profile which meets higher ground on each side, giving a pleasing effect to the eye. Approach fills will utilize surplus excavation from the nearby depressed section of Hollywood Freeway through the Civic Center area. The various interchange roadways pass through the structure on tangent, with 300-300, 350-450 and 400-400 ft. curvature beyond, designed for safe movement at 35 mph. or better.

Main parkway roadways are of 60-mph. design, with 3% maximum grades except for a short section at 4.5% near the bridge. Very careful adjustment of all approach and interchange grades and roadway positions was necessary to serve nearby major streets, which themselves will require grade separation with the freeways and with the connecting roadways.

Reinforced concrete construction is proposed as a means of lending most harmonious architectural treatment in consistency with adjacent structures. The slightly greater over-all structural height required over steel construction is not considered objectionable. Roadway clearance is a minimum of 15 ft. Appearance of underside details, as seen from different roadway levels, will be a major consideration in the final design, as is the over-all appearance. The bridge when properly landscaped is expected to help rather than harm property values in the old district in which it is located. As to the structural plan, the 2nd, 3rd and 4th decks will be supported symmetrically by a nine-column central pier, the columns of which are to be designed to obstruct headlight glare between the two one-way roadways at each level.



Open type hand rail end-pier design to be used, assuring visibility of deck roadway from curved approach ramps

The idea of a 4-level structure was first suggested by W. H. Irish, district location engineer with the state. It is a design applicable to other sites, furnishing a compact system of safe, efficient traffic exchange believed to be superior in many respects to other exchange types and comparable in cost to other types where conditions justify this design.

Over 200 Major Structures Planned

In addition to the 4-level interchange, over two hundred grade separation structures will be required on the route 2 and 165 freeways. Also retaining walls will play a part on an unprecedented scale.

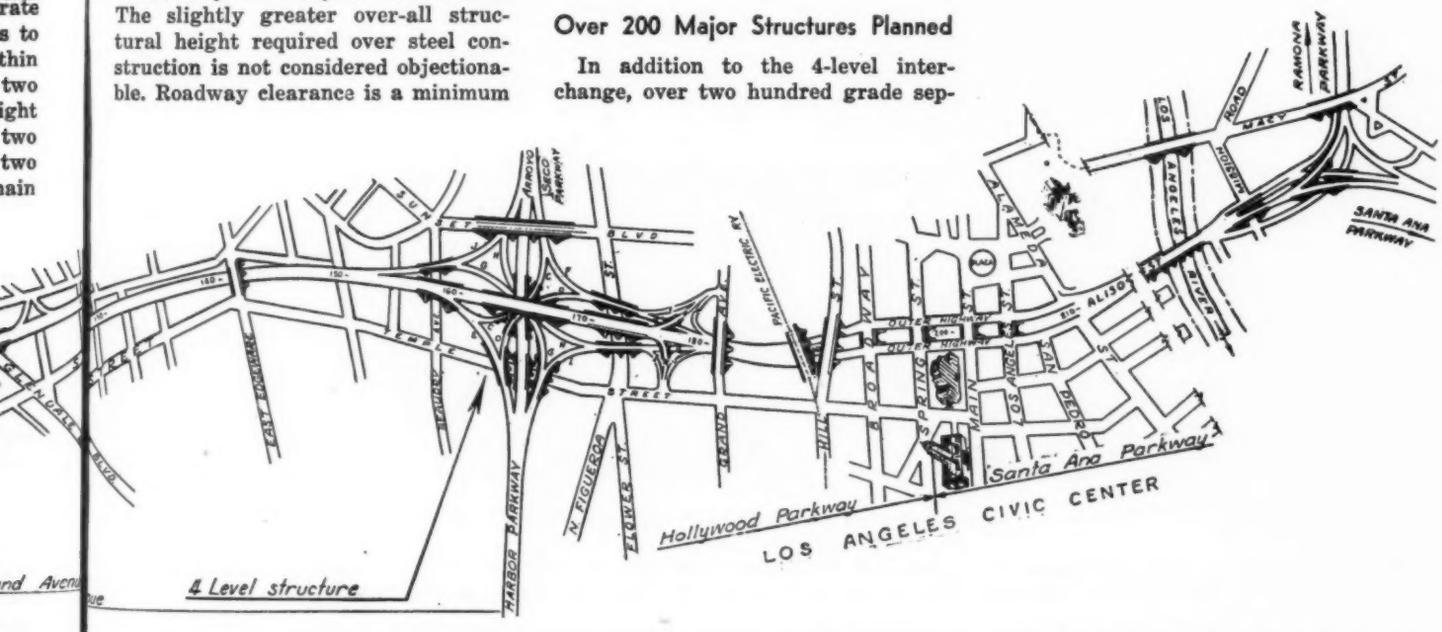
Bridges on Santa Ana Parkway have already been designed, and the engineering staff of the City of Los Angeles has undertaken design of the structures which will carry streets over the depressed section in the Civic Center area.

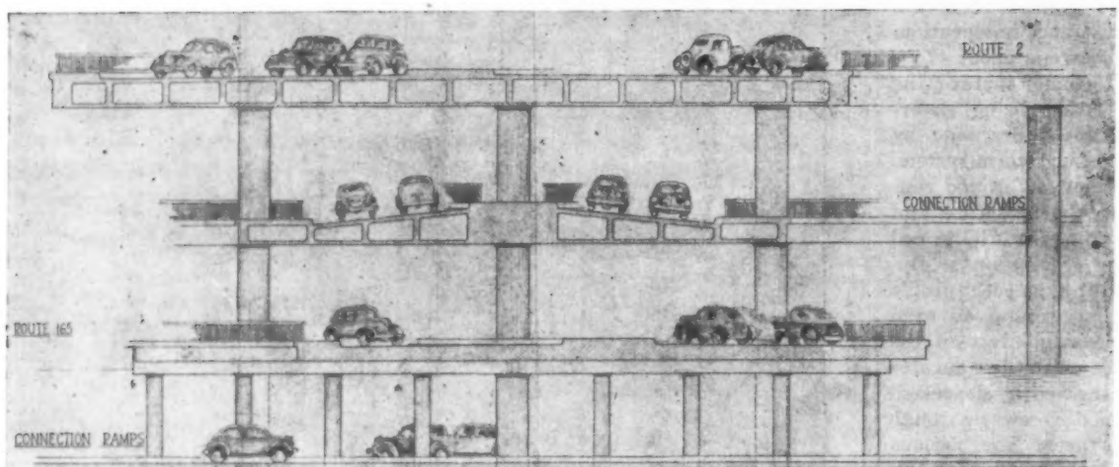
For all bridges and wall on Hollywood, Santa Ana, Arroyo Seco and Harbor Parkways every effort is being made to create a related and harmonious design appearance by the use of standard architectural details.

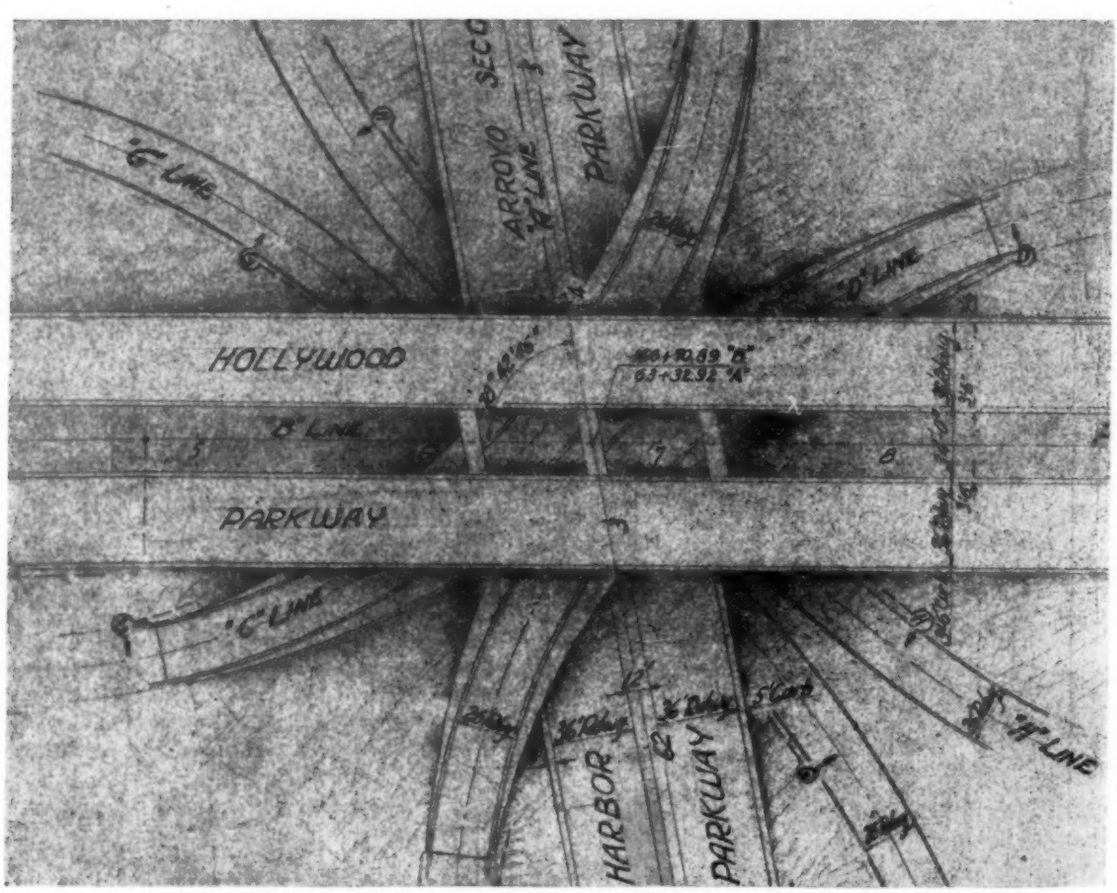
Bridges will be characterized by clean modern treatment of abutments, piers and deck facias. Arch soffits and other details have been given "softened" effects decided upon only after many preliminary sketches. Hollow box girder construction has been tentatively chosen for decks, as affording clean flat under surfaces as well as rigidity, light weight and minimum deck depth.

Earth-filled center dividing strips, complete with pleasing headlight-baffling shrubbery, will be carried across expressway bridge decks.

Bridge railing has been studied at

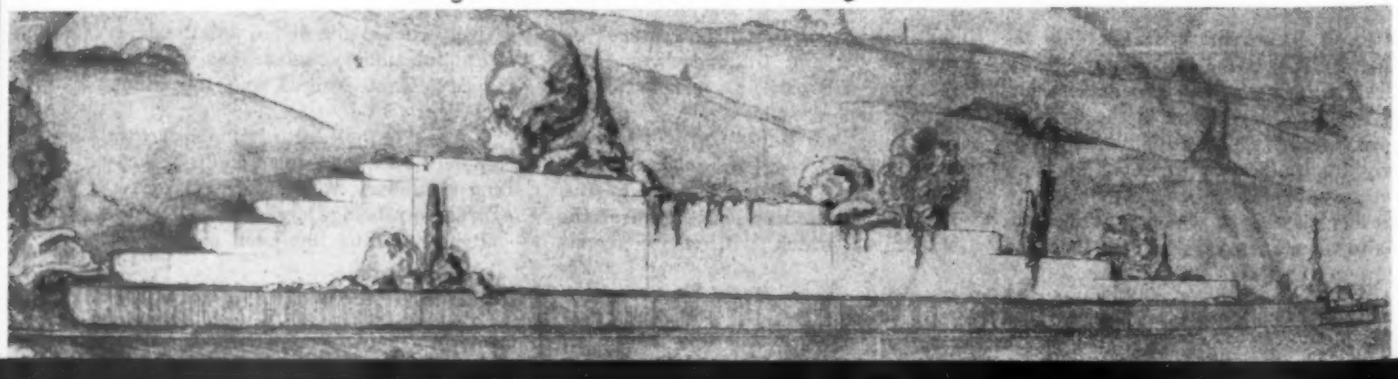






Cross-section and general plan of proposed 4-level interchange

Already completed for Santa Ana Parkway are working plans for uniquely artistic retaining walls which will help minimize or entirely avoid the bad effects of depressed design on neighborhood property values. This shows a preliminary sketch



great length, since railings are often sources of structural trouble as well as unsatisfactory appearance. The tentative standard calls for a light top rail and infrequent slender posts, with slender metal intermediate members. This "open" design is carried clear to the end in lieu of the customary long solid concrete end post, in order to afford maximum visibility along the bridge roadway to drivers coming on the bridge from curved ramps.

Bridge deck lighting is another field in which a new design conception is being worked out for this project. Lighting from customary posts is considered inefficient from several standpoints. The lights are too far above the roadway. Glare to the eye is hard to avoid. And vibration from traffic often requires frequent lamp and globe replacements. Indirect lighting thrown on the roadway from recessed installations in the bridge railing or curb is the solution being explored. Admittedly numerous problems will have to be solved, one being the added structural cost.

Retaining walls along depressed sections and adjacent to grade separations have proved to be a particularly fruitful field of architectural study. One of the basic steps is to avoid long uniform wall heights. Drawing shows how pleasing a wall can be made to appear by careful use of stepoffs. Use of curved wall ends or returns is another successful device, and particularly noteworthy is the employment of a secondary low wall at the base of the main wall and far enough out from it to act as a base for plantings.

Use of creeping vines and other plantings for slopes alone and in conjunction with walls will be a feature. The existing section of Arroyo Seco Parkway today, after several years' growth of plantings and flowers, is one of the most beautiful parkways in existence.

Army Bridge School to Open Shortly in Battle Area

WITH U. S. Forces in France—Soldier students from newly-arrived Combat Engineer Battalions were scheduled to attend the opening class of the first Army Engineer Bridge School to be established in the Western Front battle area.

The school is located in Oise Section, an advance Communication Zone supply base commanded by Brigadier General Charles O. Thrasher. Batches of 50 engineers will receive training at the school in latest German strategy especially affecting engineers, as well as bridge-building subjects, before being sent up to the front lines. In addition to these men, picked Communications Zone units will send students. All the courses will be open to officer and non-commissioned officer personnel, subject to approval of Communications Zone Headquarters.

Instructors at the school will include combat engineer specialists with actual front line experience; specially trained personnel from the Engineer School at Fort Belvoir, Virginia; and West Point graduates. All the instructors will make periodic visits to the front lines to keep abreast of the latest improvements in bridge building methods.

Apart from comprehensive courses in the Bailey Bridge and timber trestles, the school offers classes in camouflage, airfield reconnaissance, mines and booby traps. In conjunction with the school, tests will be conducted on new types of bridges, tanks, explosives, mine detectors, and camouflage.

The camouflage and airfield reconnaissance section of the school will be conducted by the 635th Camouflage Company. The 1173rd Combat Group will conduct the classes in Bailey Bridge, timber trestle, mines and booby traps. Personnel of the 1674th Utilities Detachment and Company "B," 371st Construction Battalion, will have charge of the upkeep and maintenance of the school.

Transit Study Completed by Downtown Business Group

Los Angeles, like other cities, has a downtown traffic problem. Of special interest in connection with the new Parkway herein described is the 1944 transit study for the Los Angeles Metropolitan area. This study was issued recently by the Central Business District Association for distribution to planners and other interested groups.

While pointing out that the downtown streets do not lend themselves successfully to opening or widening, this group suggests study to better signal operations; encouragement of use of designated streets for heavy vehicles; elimination of curb parking; fewer left turns into parking lots and garages; no turns at designated inter-sections; use of offset lanes on principal routes morning and evening; improvement in parking lot arrangements to prevent overcrowding at certain points and provision for an over-all parking plan.

Flight Strips

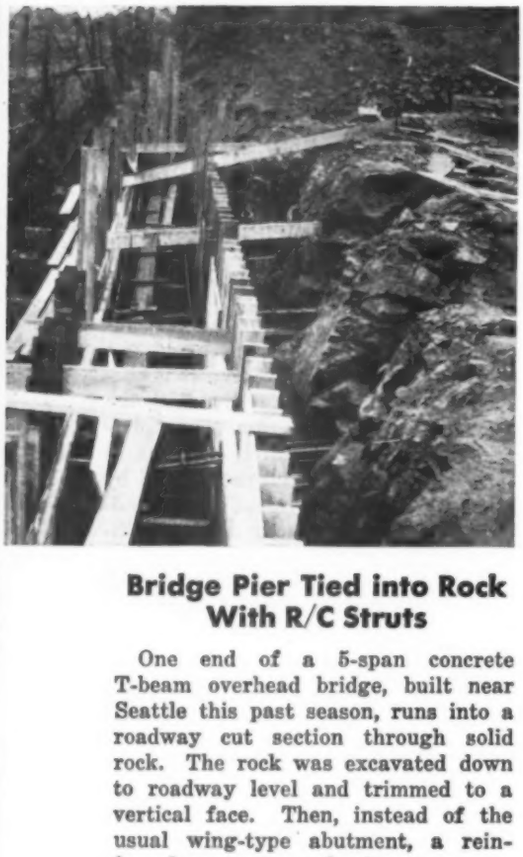
(*An editorial in the New York Times, Dec.* 23, 1944)

Although the provision which would have included the particular type of aircraft facility known as "flight strips" was deleted from the Federal Aid Highway Bill, this is one of the matters which merits further consideration. The flight strip should not be a subject of controversy. It is corollary to and not competitive with the over-all airport program. By definition it is a landing area adjacent to the highway, built and maintained by the Highway Department and intended to add another factor to the facilities of flying. That the theory behind the flight strip idea—namely, construction by the Highway Department because of its possession of the materials, the machinery and in many cases the rights-of-way required—is sound is evidenced by the fact that authorizations for the construction of flight strips already are included in the laws of twenty-eight States, and more than five additional States may build such land areas without new authorizations from their Legislatures.

State airport interests should not be pitted against State Highway Department interests in this field. Actually there should be a community of purpose here, with aims complementary and not counter to each other, to provide maximum facilities for flying. Men who have had practical experience with flight strips for military use (for which $17,000,000 has been expended in the United States and Canada), have predicted that these facilities will have a place in our postwar world. They have described them as one answer to mass air accommodations with a minimum of maintenance and maximum value received for limited expenditure.

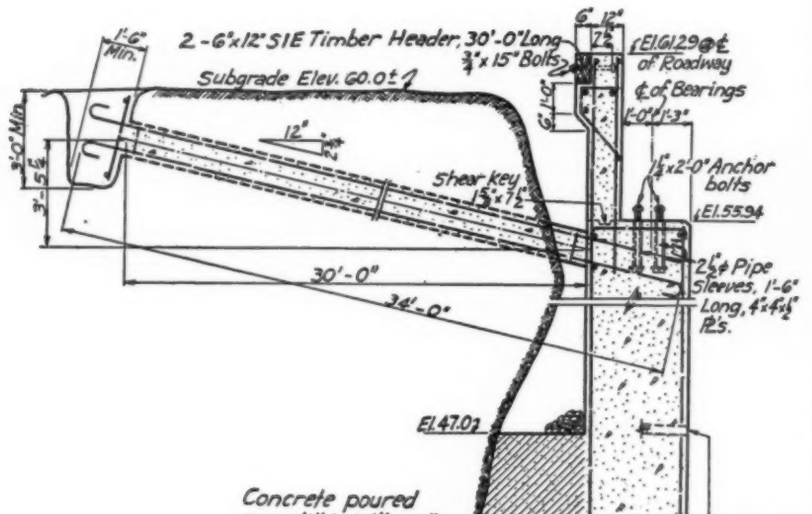
JOB and EQUIPMENT IDEAS

Labor and time saving job kinks and interesting construction features, noted by R & S editors in their travels or sent in by readers. Send in your suggestions with sketches or snapshots.



Bridge Pier Tied into Rock With R/C Struts

One end of a 5-span concrete T-beam overhead bridge, built near Seattle this past season, runs into a roadway cut section through solid rock. The rock was excavated down to roadway level and trimmed to a vertical face. Then, instead of the usual wing-type abutment, a reinforced concrete end pier was constructed just out from the stone face and the wall anchored into the face by means of four reinforced concrete struts placed at intervals along the wall. See sketch. After beginning construction it became desirable to fill in with lean-mix concrete behind the pier, as shown in sketch, in place of gravel orginally specified. Also some revision in the ties was necessary, principally to lengthen them for anchorage into solid material. Data obtained through R. W. Finke, bridge engineer, and Geo. H. Shearer, district engineer, Washington state highway department. McRae Bros. of Seattle, contractor.



Safety Rails Protect Workers on Winter Sanding Trucks

In using tailgate sandspreaders for sanding operations during the winter months, the Massachusetts road maintenance forces found it necessary to insure proper protection to workmen in the body of the truck. These men are in constant danger of being knocked off balance by the movement of the vehicle, particularly when collisions occur during icy periods. In order to afford proper protection, standard types of body guard rails have been designed and are now used on all department trucks.

As reported by J. E. Lawrence, maintenance engineer, Massachusetts dept. of public works.

Utah Road-Mix Processed on Pavement, Bladed into Widening Strips

An access road to the Dugway Chemical Proving Grounds near Salt Lake City had to be widened from 16 ft. to 22 ft. for a distance of 33 miles. The contractor was instructed in the fall months of 1943 to spread road-mix aggregates along the shoulders. Then in the spring of 1944 the material was thrown onto the existing bituminous roadway by means of a grader with a 3-ft. extension on the blade (the grader staying on the pavement). The material was processed with asphalt by usual turnover methods, split into two windrows and bladed back onto the shoulders, where the mix was compacted with a 10-ton smooth roller. The entire 22 ft. of width was then sealed. J. M. Simpson of Springfield, Utah, was the contractor.

Pick-up, Bunk House, or What?

Here's a snapshot of a handy piece of rolling stock seen on L. G. Arnold's paving and grading contract near Harvard, Ill., where this firm rebuilt a piece of U. S. 14 during 1944. The idea of the unit seems to be versatility. As a matter of fact it was carrying miscellaneous tools, but could be converted in no time into a bunk house, cook shack or repair truck.

The front end is handy for lifting heavy parts in field repairs, etc. The boom angle is adjusted by a pair of pulley lines reeved to a hook at the boom end, anchored to the top of a stiff-leg or A-frame over the cab and operated by a drum inside the house.

How Stringers Were Held Up While Floor Beams Strengthened

The steel floor beams in an old truss bridge on U. S. 160 at Moab, Utah, (three 200-ft. spans) proved to be the weakest elements in the structure, as shown by a condition survey and stress analysis. It was determined that plates welded on the tops and bottoms of the beams would, with little other repairs, permit raising the posted load limit from 8 tons up to 16 tons.

In performing their repair contract Young & Smith Const. Co. of Salt Lake City, worked as follows (see photos and sketch):

1. A timber frame having 4 x 6's, as shown in the sketch, was constructed to a length about 6 ft. greater than the length of the floor beams. The bottom of the frame was planked to form a walkway.

2. This frame was floated or carried to a position under a panel point and raised until the 4 x 6's were in contact with the wood stringers on either side of the beam.

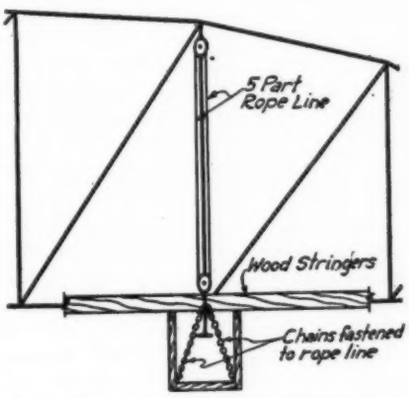
3. The wood stringers at successive floor beam points were then raised clear of the beams by means of a 5-part block line anchored to the top chord joint and leading via chains down to the corners of the timber frame. A double-drum hoist on a truck stationed in the next panel furnished the lifting power.

4. While the stringers were thus held in the clear the top of the I-beam was cleaned and ½ x 6-in. plates were welded on the top and bottom. These plates, which overhung the flange of the I slightly, were fillet-welded along each flange edge.

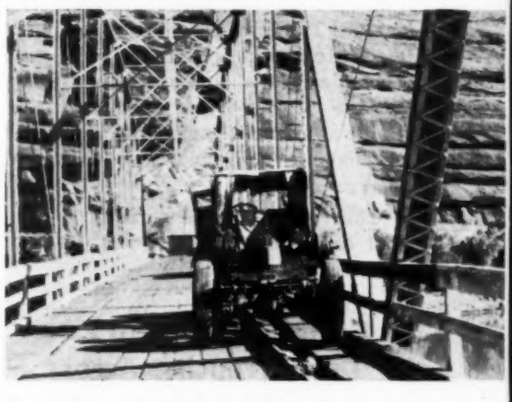
5. The frame was then let down into the stream and the frame and rigging moved to the next panel point, when the operation was repeated.

Only about three hours' interruption to traffic was required per panel. Hours of closure were posted in advance at Crescent Junction and Montecello, the nearest towns in each direction, also in local newspapers.

The foregoing information was furnished by Paul W. Masters, bridge engineer, Utah state road commission, Salt Lake City.

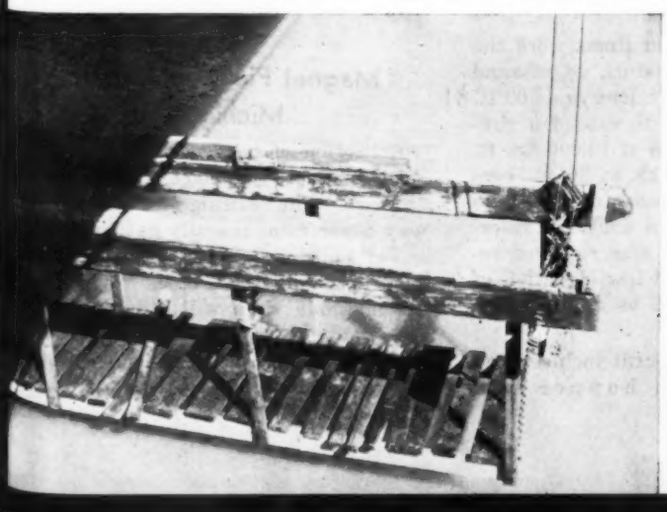


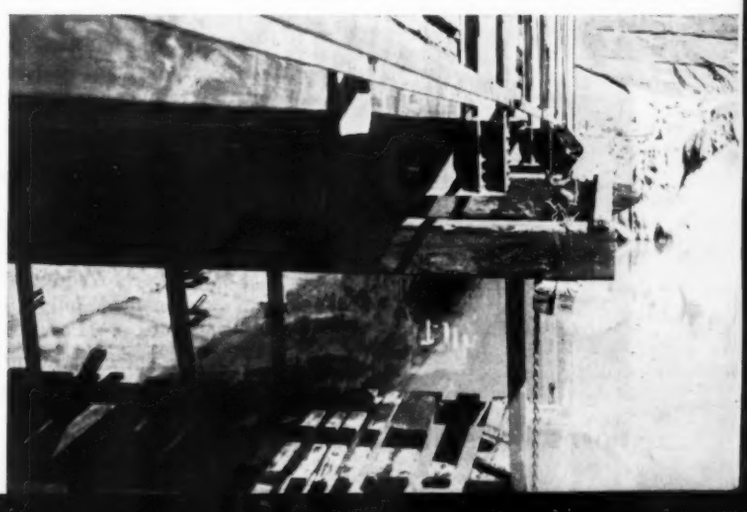
Showing general arrangement of rope lines and chains



Power for raising frame to position and forces stringers up off of I-beams was applied by a winch on a truck started in the next panel

Timber frame being hoisted up to position to stringers. (Right): Another view of timber frame taken when it was raised almost into position





Mobile Water Heater Aided Early Winter Concreting

It got pretty frosty last November on White Consolidated's U. S. 66 paving contract south of Pontiac, Ill. When the "heat" was put behind them to finishing certain paving and structures before shutting down for the winter, the contractor installed the usual torch in the mouth of the paver drum and heated mix water. Water was delivered by a fleet of large gasoline tank trucks (rented for this job in place of laying water line). It was heated to specification temperature by means of two boiler units mounted on a truck along with a 400-gal. hot water tank and small full tank. The boilers were fired with distillate pressure burners. A small portable water pump was stationed by the heater truck, pumping from the water truck and sending water through the coils and tank and on to the paver.

This outfit was designed to heat and deliver hot water for any equipment up to two 34-E pavers.

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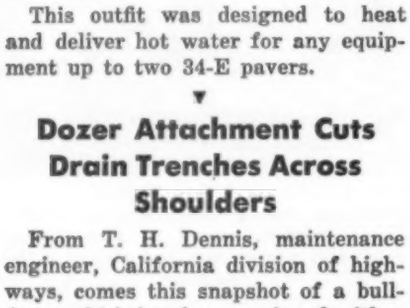
Dozer Attachment Cuts Drain Trenches Across Shoulders

From T. H. Dennis, maintenance engineer, California division of highways, comes this snapshot of a bulldozer which has been equipped with a successful trenching device for cutting drain lines across improved shoulders. The attachment, only partly visible above ground, consists of a rooter on the lower end of two lengths of salvage railroad rail bolted in vertical position at the center of the dozer apron. The rails extend about one foot below the cutting edge. (The lower portion of the rails in the photo is obscured by clayey material lodged between the rail.)



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Big-Tired Earth Wagons Tote Water and Concrete Over Blow Sand

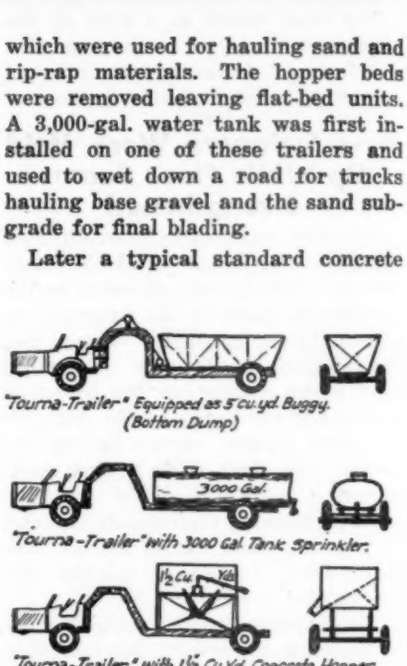
Use of a big-tired self-powered dump trailer successively converted to sprinkler unit, and concrete delivery truck, was the contractor's answer to a bad traction condition last year on the CAA's North Bend, Ore., airport (near Coos Bay on central Oregon coast).

Kunkenberg Construction Co., Portland, Ore., was the contractor. The grading, as related by Chas. T. M. Echols, acting resident engineer, involved "blow sand," all passing a No. 20 sieve and retained on a No. 40, which in its dry state provided "no traction whatever" for usual wheeled vehicles. Ordinarily, consideration would have been given to hydraulic methods, but instead, tractors and scrapers were used for leveling and filling, and trenches for drainage lines were opened through supersaturated sand with some difficulty.

The major contract items were the movement of 1,000,000 cu. yd. of sand to make a fill 1,800 ft. long and 700 ft. wide into Coos Bay to extend a runway; and installation of 14,000 lin. ft. of drainage lines (12 to 36 in. concrete pipe) with necessary manholes and other fixtures. A drainage reservoir with tide gates was required because of the general low elevation of the field, only 14 ft. as against high tides of 11 ft.

The contractor's outfit included two Tournatrailers with hopper beds, which were used for hauling sand and rip-rap materials. The hopper beds were removed leaving flat-bed units. A 3,000-gal. water tank was first installed on one of these trailers and used to wet down a road for trucks hauling base gravel and the sand subgrade for final blading.

Later a typical standard concrete


"Tourna-Trailer" Equipped as 5 cu. yd. Buggy. (Bottom Dump)
3000 Gal.
"Tourna-Trailer" with 3000 Gal. Tank Sprinkler.
1½ Cu. Yds.
"Tourna-Trailer" with 1½ Cu. Yd. Concrete Hopper. Standard Conc. Chutes were used with this hopper.

hopper of steel construction was installed. This trailer, with hopper, was used to convey concrete from a central mixing plant to the many manholes, the tide-gate structure, and other concrete work. This trailer could be operated anywhere on the loose sand and particularly alongside 12-ft.-elev. excavations for pipe and manhole installation, where no other wheeled equipment could have been used, and where mixers or aggregate would have had to be brought by tractor.

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Magnet Picks 'Em Up in Michigan

Collection of hardware by use of a road magnet continues to yield a harvest. The Michigan state highway department recently gathered 400 lb. of nails and other metal objects from 200 miles of truck highways. Innumerable tires will stay in service, thanks to this accumulation, which included nails, tacks, spikes, pieces of wire, bolts, etc.

$3,000,000,000 Postwar Road Bill Now a Law

Preliminary report from state highway departments on needed state legislation to tie in

PRESIDENT ROOSEVELT on Dec. 20 signed the "Federal-Aid Highway Act of 1944" making available $1,500,000,000 in federal aid funds for postwar highway construction. This action now places the responsibility of postwar preparation squarely upon the states and their political subdivisions. With 44 of the 48 state legislatures meeting next year it is hoped that appropriate legislation will be passed to permit full participation by every state. Also, with advance knowledge as to the amount of federal funds available, the state legislatures are now in a position to render such legislative assistance as may be necessary to assure adequate preparation of the postwar program.

Highlights of New Law

Presidential approval of the postwar highway measure marks the entry of the federal government into several new phases of road building. Among these are: allocation of funds for urban highway improvements; allocation of funds for a large farm-to-market program, and payment by federal government of one-third of the cost of rights-of-way. Highlights of the measure are:

1. Authorizes the appropriation of $500,000,000 for each of the three successive postwar years.

2. Divides annual authorizations in the following manner: (a) $225,000,000 for projects on the Federal-aid system; (b) $150,000,000 for projects on the principal secondary and farm-to-market routes; (c) $125,000,000 for projects on the Federal-aid system in urban areas.

3. Apportions funds among the states on the following basis: (a) Federal-aid system, ⅓ area, ⅓ population, and ⅓ road mileage; (b) Secondary system, ⅓ area, ⅓ rural population, and ⅓ mileage of rural delivery and star routes; (c) Urban highways in the ratio which the population of municipalities of 5,000 or more in each state bears to the total of such population in all the states.

4. Funds are available for one year after the fiscal year for which they are apportioned, after which time they lapse.

5. Construction costs are on a 50-50 matching basis.

6. Right-of-way costs allowed up to one-third of the total.

7. Entire construction cost of grade-crossing projects paid from federal funds, also 50 per cent of right-of-way costs.

8. Standardization of signs and markings.

9. Provides $173,250,000 for highway improvements in parks, Indian reservations and other public lands.

Apportionment of First $500,000,000 Federal-Aid Highway Act of 1944

State	Federal-aid Highway System	Farm-to Market Roads	Urban Highways	Total
Alabama	$ 4,712	$ 3,732	$ 1,303	$ 9,748
Arizona	3,231	2,235	262	5,728
Arkansas	3,854	3,103	558	7,516
California	9,019	5,162	8,122	22,303
Colorado	4,100	2,718	934	7,692
Connecticut	1,395	766	2,607	4,769
Delaware	1,097	731	204	2,032
Florida	3,237	2,168	1,660	7,004
Georgia	5,649	4,310	1,622	11,581
Idaho	2,786	1,948	212	4,946
Illinois	8,847	4,762	9,511	23,120
Indiana	5,402	3,622	3,066	12,090
Iowa	5,567	3,980	1,592	11,139
Kansas	5,661	3,973	1,107	10,741
Kentucky	4,203	3,405	1,300	8,908
Louisiana	3,371	2,524	1,532	7,427
Maine	1,949	1,404	561	3,914
Maryland	1,831	1,170	1,790	4,792
Massachusetts	2,943	787	6,612	10,342
Michigan	6,827	4,129	5,682	16,638
Minnesota	6,055	4,171	2,206	12,432
Mississippi	4,041	3,334	600	7,975
Missouri	6,660	4,563	3,151	14,374
Montana	4,548	3,107	308	7,963
Nebraska	4,476	3,159	783	8,418
Nevada	2,868	1,922	61	4,851
New Hampshire	1,097	731	475	2,303
New Jersey	2,864	1,041	5,527	9,433
New Mexico	3,637	2,518	257	6,412
New York	10,840	4,276	18,776	33,892
North Carolina	5,433	4,454	1,492	11,379
North Dakota	3,348	2,412	215	5,974
Ohio	7,905	4,658	7,540	20,102
Oklahoma	5,070	3,724	1,348	10,142
Oregon	3,729	2,545	811	7,084
Pennsylvania	9,185	5,270	10,517	24,973
Rhode Island	1,097	731	1,123	2,951
South Carolina	3,050	2,518	654	6,222
South Dakota	3,535	2,516	222	6,274
Tennessee	4,769	3,668	1,593	10,030
Texas	14,258	10,043	4,464	28,766
Utah	2,531	1,686	434	4,651
Vermont	1,097	731	212	2,040
Virginia	4,114	3,191	1,491	8,797
Washington	3,537	2,395	1,467	7,399
West Virginia	2,474	2,080	808	5,362
Wisconsin	5,435	3,681	2,654	11,770
Wyoming	2,796	1,897	133	4,826
Hawaii	1,097	731	393	2,222
District of Columbia	1,097	731	1,146	2,975
Puerto Rico	1,110	1,132	835	3,077

New York Gets Largest Grant

New York State gets the largest share with a total of about $34,000,000 annually, while Texas and Pennsylvania are next with $28,000,000 and $25,000,000 respectively. The attached table gives a detailed analysis of the $500,000,000 annual authorization, shown by states and category of improvement.

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Scene Shifts to States

With the passage of the highway bill the scene shifts from Washington to the respective states. Each state highway department now knows exactly how much federal highway aid money it can count on for the first three postwar years. That uncertainty is over.

But new problems are created. First of these is that the state must count its change, estimate its highway revenues and set up its finance to fit the allocations under the new formulas, of which there are not just one this time but three. Where will the matching monies have to come from for secondary and urban projects? Now that federal authority is given for providing limited access, what new state legislation is needed? What

new right of way laws? What new state highway revenue sources must be considered? What new state-county-city split-up, if any?

In addition to such legal questions there is the administrative problem of establishing a new working relationship between state and local agencies to insure over-all planning and to encourage full local initiative in project selection and design matters under state guidance and federal approval.

Early Opinions from Several States

While it is too early to survey the entire legislative picture, ROADS AND STREETS has received advance expressions from several state highway leaders, who are quoted briefly as follows:

Michigan: "Our only problem is finances. We now have legislative authority to cover the other features of the program, such as the establishment of routes, right of way acquisition, limited access, etc. This applies to counties and municipalities as well as the state highway department."—Charles M. Ziegler, State Highway Commissioner.

South Carolina: "We would not need any additional legislation to carry out this program. We are restricted, however, on the amount of State money that can be spent in towns and cities of over 2,500. The Legislature can remove these restrictions, or the cities or towns can provide the matching funds over and above that provided for under our present legislation."—C. R. McMillan, State Highway Engineer.

Massachusetts: "Do not believe we will require new legislation. There will undoubtedly be many bills concerning fund diversion, traffic regulation, truck and bus weight limits, etc."—Commissioner MacDonald.

Wisconsin: "Probably state means will be available for matching the federal aid funds, assuming no substantial change in current state highway appropriations and reasonable participation in the program by local units of government. We do have a certain normal annual accrual of funds which has been and will continue to be placed in a post-war highway improvement fund.

"At the present time it appears likely that legislation will be introduced to segregate highway revenues in a separate state highway fund to prevent future diversion at the state level."—E. L. Roettiger, State Highway Engineer.

Missouri: "Our Legislature meets this month. However, during the past year we have had a Constitutional Convention in this state which has drawn up a new Constitution to be voted on on February 27, 1945, and I am sure that no state laws affecting highways will be introduced and passed by the Legislature until after it is known whether or not this new Constitution has passed. If it passes, it gives authority for limited access, the construction of highways through towns and cities of over 2,500, and other provisions which of course will require enabling acts and undoubtedly several laws will be introduced which will affect our highway program in many ways."—C. W. Brown, Chief Engineer.

W. Virginia: "Although the Commission has the obligation of constructing and maintaining primary highways through municipalities, it does not have traffic regulatory powers within corporate limits. It will therefore be necessary for the Legislature to provide such authority if we are to participate in Federal funds provided for urban areas.

The Commission is vested with responsibility of constructing and maintaining secondary, as well as primary roads and we no longer have county road systems. We also have a limited access highway law. Our right-of-way laws permit prompt entry and are apparently satisfactory."—M. L. O'Neale, Chief Engineer.

North Dakota: "No legislation is needed relative to designating highway routes in our state. Laws relative to defining and permitting limited access are not needed here as yet.

"Our department will recommend the passage of laws allowing immediate possession of rights of way after condemnation proceedings have been started; also the revising or amending of the present gas tax refund law so that it will more nearly provide the revenue that should be provided by this tax."—. M. P. Wynkoop, Chief Engineer.

New Mexico: "Unquestionably some legislation will be enacted to permit the state highway department to cooperate with cities and municipalities. At present we are permitted to enter into Cooperative Agreements with the Counties, and in view of our proposed activities in the urban areas, it will necessitate a somewhat similar law for a like cooperation with cities."—F. G. Healy, State Highway Engineer.

Delaware: "At the coming assembly session, our Department plans to submit an act providing for limited access rights-of-way, and for funds for matching federal aid. The Department has authority to designate any system of highways and our right-of-way laws are adequate."—W. W. Mack, Chief Engineer.

Kansas: "We feel present laws in this state will allow us to carry on this program, with the exception that we have no law defining and permitting limited access. This matter will be brought before the Legislature for its consideration."—R. C. Keeling, State Highway Engineer.

Maine: "Of first importance will be the need to provide matching funds. This will require a rather complete rearrangement of past highway program or a bond issue, or a combination of both. We may need some legislation relative to the designation of the National Inter-regional System and possibly a revision, or perhaps an entirely new law relative to limited access roads."—Lucius D. Barrows, Chief Engineer.

Florida: "The Department is fortunate in that there is a substantial cash surplus on hand to aid in post war highway construction. We are hopeful that favorable anti-diversion legislation may be enacted this year."—J. H. Dowling, State Highway Engineer.

Iowa: "Little or no legislation is absolutely necessary in Iowa to enable the state to be ready to cooperate. However, the Iowa Postwar Rehabilitation Commission (created two years ago) has recommended a considerably enlarged highway program over that provided by merely matching the Federal aid road funds under the new act. This proposed program which has been recommended will require considerable legislation."—F. R. White, Chief Engineer.

N. Hampshire: "New Hampshire already has sufficient laws for acquiring right of way; also a limited access law. We are revising our State Highway laws, to be submitted to the legislature. At present this revision is not wholly prepared. Undoubtedly we will need legislation to approve the proposed designated routes on the National Interstate System."—F. E. Everett, Commissioner.

Washington: "Present statutes are adequate. However, recommendations will be made for amendment of existing statutes to facilitate and speed up acquisition of rights-of-way. Heretofore acquisition of way was frequently a source of delay. Other legislation to be recommended will involve roadside control and limited access roads."—Burwell Bantz, Director of Highways.

States which are reported to require no important new laws other than routine appropriation of funds include Pennsylvania, Virginia, Montana, California, Illinois, Minnesota, N. Carolina, N. Jersey, New York and Massachusetts (incomplete list).

Editorial

Blood On Our Hands

PLANNING has had the spotlight so much lately that little has been said about safety. But traffic accidents continue to take their toll, and every broken body carried out of an auto wreck indirectly splashes blood on road and street designers as well as law makers and enforcement agencies.

The viper in our midst is complacency. The nation prior to the big December reverses had just awakened in dumb horror to the fact that the first three years of war (through November) cost 120,000 dead and 300,000 injured. Yet in that same period traffic tragedies took 110,000 lives and injured three and one-half millions. Official summary for 1941 is 39,969 deaths and 1,450,000 injuries. The figures were lower in 1942 and 1943, as a result of curtailment in both speed and volume of traffic, but rose again in the past year to give an inkling of further rises to come some day.

When an accident suddenly snatches a member of your own family circle, or dooms someone dear to you to disfigurement or life as a cripple, it stirs the crusading spirit.

But why must every road official wait for that? This is a task that thousands of highway engineers need to get burned up over.

The ultimate job is to plan and build highways so designed that accidents will seldom occur under reasonably intelligent traffic laws and zealous patroling. After the war we can't be in enough of a hurry to get modern inter-city expressways such as Merritt Parkway in Connecticut, which has carried traffic with only 3.7 deaths per 100 million miles of travel, compared with 11.4 deaths on the old paralleling Boston Post Road.

But now replacement of dangerous, obsolete roads must wait. Maintenance of existing roads in safe conditions is of course a prime task. But highway officials can also take a more active hand in matters of traffic law and enforcement. The roads are full of over-age, poorly maintained vehicles today. More rigid safety tests are needed, to rule the dangerous vehicles off.

It takes political courage to require and rigidly apply such tests. Requiring even more political courage is the more fundamental task of weeding out unfit drivers. No one would think of letting a half blind, slow witted or emotionally unstable person fly a plane. He would have to be licensed, and if unfit he wouldn't qualify. But in most jurisdiction he can pile his family into his car and hit for the open road and no one dares stop him.

What can be done now about tightening traffic laws, driver license requirements and enforcement in your area? Even when the job reaches beyond your jurisdiction as a highway or street department official, you can render a real service by helping to publicize safety needs and by offerings expert advice.

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More Blueprinting Speed?

NOW that Congress has given us a program, there is no excuse for engineers not to get going faster on post-war construction plans, was the concensus of highway authorities just before Christmas.

Then came the bad news in Europe, a new national psychology, and the new demand for all-out war mobilization at home.

We might as well face the truth. Resumption of normal road building certainly is farther off than the optimists hoped there for a while. But the shelf of ready post-war state highway projects has been growing at the rate of about a million dollars a day recently. The latest summary, given elsewhere in this issue, is both a disappointment and cause for encouragement, depending on the state of mind. The main thing is to keep the shelf growing. The best service highway engineers can render their country is to continue to utilize limited manpower as skilfully as possible now, so that thousands of returning veterans some day can go to work on immediate jobs on needed construction projects.

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Dust off Planning Surveys

THE PASSAGE of the new road bill throws the spotlight anew on our roads as a collection of *systems*, and the need for economic and traffic research into the respective services of these systems in each state. A new National System to be designated under the new law is not to exceed 40,000 miles, will comprise roughly 1⅓% of the roads but will carry about 20% of the rural traffic, as compared to the 7% federal aid primary system which carries about 50% of the rural traffic.

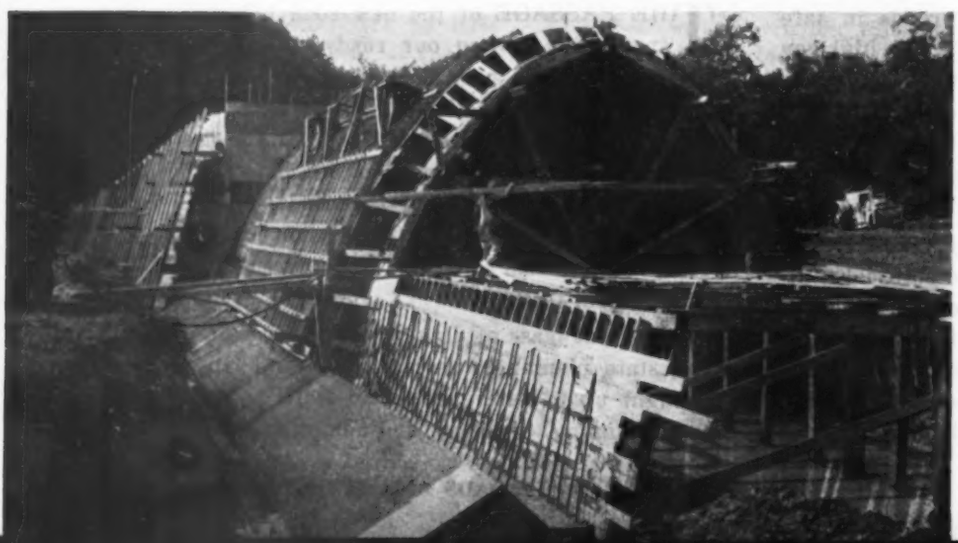
The great mass of data gathered before the war in the state planning surveys needs to be dusted off, brought up to date and put to work as a means of wise planning, financing and administration.

Union Const. Co., Passaic, N. J., built this arch, also on the U. S. 22 job. Concrete was placed partly with a crane and 1-yd. concrete bucket, taken from a stationary paver, and partly by dumping ready-mix onto an elevating belt loading to a drop hood. Hand operated gas-powered vibrators were an important adjunct

Pennsylvania capitalizes basic advantages of

Concrete Arch Culverts

One of several large concrete arches built during 1944 on U. S. 22, dual access project east of Harrisburg. Hempt Bros. of Camp Hill, Pa., the contractor, is hauling from adjoining cuts, spreading with dozer help and rolling a 150,000-cu. yd. fill around this 150-ft.-long barrel



THE Pennsylvania Department of Highways has used concrete arch culverts for many years on the highway system as this type of culvert is economical when properly designed, not difficult to construct, economical to maintain, furnishes a permanent structure and provides a pleasing appearance. Because of the inherent quality of an arch to adjust itself to many variables of construction and loading, this type of structure has been used very extensively by the Department with very good economic results, consideration being given in each case that the arch be supported by the proper foundation.

The shortest standard span concrete arch culvert used is 6 ft., the longest 20 ft. Spans shorter or longer than this range are considered as special and are designed accordingly.

The standard drawings prepared for concrete arch spans of 6 to 20 ft., with spans varying by two feet, provide for such arches placed at 90, 75, 60 and 45 degrees with the roadway with the right angled-span remaining the true span.

The design of these structures follows standard practice with the base width of abutments such that a good average foundation material or rock must exist at the culvert locations,

Formwork was a considerable item on arches in the Union Const. Co. contract, which included a bid item of $40.00 per cu. yd. for 501 cu. yd. Class A concrete, $30.00 for 6,759 cu. yd. Class B concrete in place, $0.06 for 352,841 lb. reinforcing steel, and $1.75 for 1,290 sq. yd. waterproofing

but the culverts may be placed on piles providing tie walls are placed between the abutments to compensate for abutment movements from thrust and backfilling operations, or the smaller spans may be placed on a reinforced concrete slab extending across the stream bed to act as a mat.

The culvert design is also predicated on light fills where live load action will affect the arch stresses and also for fills of definite height where the dead load of the fill on the arch barrel is the criterion for load. In the former case parapets are provided adjacent to and above the roadway, while in the latter case a low spandrel wall is provided to catch the fill slope, with an allowance made in the length of the arch barrel to compensate for future sluffage.

The shape of a concrete arch ring may be adjusted for innumerable conditions of fill and as the height of the arch increases for the same particular site, the length of the structure decreases, especially under high fills, even though the wing walls increase in height accordingly, and a more economic structure results.

The majority of these structures are placed under fills of such heights that only the low spandrel walls are required, thus allowing the standard guard fence to be constructed throughout the area of the fills with no visible indication of a structure to highway travelers and providing a safe, clear highway of uniform appearance and width.

Our standard design sheet S-705 shows the quantities of concrete and reinforcement required for each span and clear for a 90-degree culvert. Plain concrete or reinforced concrete arches are also provided for, and the particular type used depends on the foundation material at the site and the depth of fill over the arch ring and the proposed skew of the structure. When prices bid locally for the different items are applied to the quantities for a particular span and clear, the cost per unit length of culvert may easily be obtained.

Typical of Pennsylvania practice is this culvert built recently in Lackawanna County. Note concrete brackets for carrying water pipes

▼

Largest Single Girder Bridge Constructed

With U. S. Engineers in Belgium —An Advance Section Communications Zone engineer company recently built the largest single steel girder highway bridge on the continent over the Meuse river in France. After long days of sweat and hard work, the engineers had time to marvel in their job of linking communications in order that supplies could roll through to the front. The span which they welded together measured 226½ ft.

Sergeant Richard L. Francis, of New Orleans, La., who was in charge of the job, said: "We used the electric arc weld, because the welding is always stronger than when bolts, rivets and braces are used. Individual girders, varying from 22 to 28 in. in height.

The different girder heights made it very difficult to assemble and construct the piers, for the floor of the bridge had to be level. Differences were taken up by pier blocking.

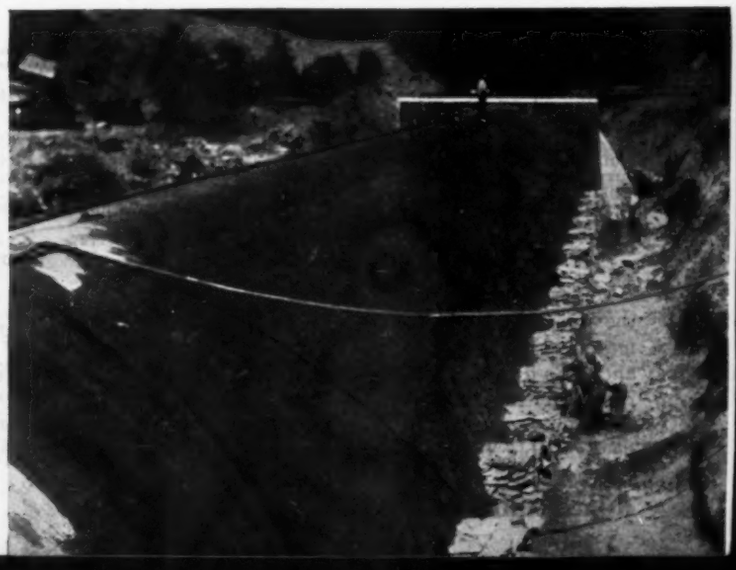
The former bridge was a 5-span stone arch structure. The new girder replaced three of the spans.

The engineer company salvaged the two German steel intermediate piers, but only three of the 21 steel beams of the original bridge could be used.

▼

$450,000,000 Highway Backlog—Due to decreased construction the past three years the states have a highway fund surplus of about $450,000,000. States having the greatest accumulations are Pennsylvania, California, Texas, North Carolina and Virginia.

Steps in backfilling, which should be done with great care to insure uniform compaction and barrel pressure. Stone and other granular materials was placed in the trench immediately above the footings



State Highway Construction

Status of post-war programs on Dec. 1, as reported by officials of highway departments of various states

New England Division

MAINE

	Total Est. Cost
Ready for bids in 90 days	$ 8,517,000
Surveys completed, plans underway	6,838,000
Surveys underway	14,710,000
Surveys not yet started	1,750,000
Total	$31,815,000

The item "surveys underway" includes surveys for proposed new road between Kittery, Maine, and Portland, Maine, which may be developed later as a toll road or as an express highway. At the present time no definite statement can be made that this road will actually be constructed.

NEW HAMPSHIRE

	No. of Projects	Total Est. Cost
Ready bids	..	.....
Plans completed, right of way being secured	..	.....
Surveys completed, plans underway	18	$ 6,000,000
Surveys underway	14	5,300,000
Surveys not yet started	18	3,200,000
Total	50	$14,500,000

VERMONT

	No. of Projects	Total Est. Cost
Ready bids (i.e., plans submitted to Public Roads Adm., and ROW secured)	18	$ 1,753,198
Plans completed, right of way being secured.	3	105,349
Surveys completed, plans under way	17	2,578,604
Surveyed, but plans not started	15	2,507,600
Survey underway (or partly surveyed, and surveys to be completed later)	13	2,659,700
Survey not started	10	1,579,400
Total	76	$11,183,851

MASSACHUSETTS

	No. of Projects	Total Est. Cost
Ready for bids	42	$11,200,000
*Plans completed, right of way secured	6	1,900,000
Surveys completed, plans underway	43	24,400,000
Surveys underway	19	34,400,000
Surveys not yet started.	12	15,800,000
Total	122	$87,700,000

*Also ready for bids.

RHODE ISLAND

	No. of Projects	Total Est. Cost
Ready for bids	5	$ 1,130,000
Plans completed, right of way being secured	4	400,000
Surveys completed, plans under way	8	3,044,000
Surveys underway	12	2,327,000
Surveys not yet started.	32	12,840,000
Total	61	$19,741,000

Under "surveys not yet started," the sum shown represents the estimated cost of our Post-War Survey and Plan Project, which has been approved by the P. R. A. No assurance can be given, however, that funds will be available for the entire program.

CONNECTICUT

	No. of Projects	Total Est. Cost
Ready for bids (plans complete, right of way acquired)	120	$10,704,000
Surveys completed, plans underway	78	17,025,000
Surveys completed, plans not started	35	7,644,000
Surveys underway	32	29,950,000
Surveys not yet started.	..	.....
Totals	265	$65,323,000

Middle Atlantic Division

NEW YORK

	No. of Projects	Total Est. Cost
Ready for bids, plans completed (334 miles).	97	$32,080,000
Surveys completed, plans underway	..	.....
Surveys underway	..	.....
Surveys not yet started	..	.....
First year program; total estimated cost of work	..	*$106,000,000

*State Highway, Thruways, Parkways, R. R. Grade Separation, City Arteries and Village Connections.

NEW JERSEY

	No. of Projects	Total Est. Cost
Ready for bids	14	$ 9,817,500
Plans completed, right of way secured	6	6,770,000
Surveys completed, plans underway	26	44,122,500
Surveys underway	11	22,780,000
Surveys not yet started.	17	64,435,000
Plans completed, right of way not secured	3	1,190,000
Total	77	$149,115,000

The above number of projects and costs represent the list which is being built up as a post-war shelf and it is not known at this time how much of the work it will be possible to get out in what is commonly known as the post-war period.

PENNSYLVANIA

By April 1, 1945, the State Highway Department hopes to have plans ready for upwards of $55,000,000 worth of post-war work. In addition plans will be well along for a sizable additional amount but not all of the complications and other preliminary arrangements will be completed by April 1.

East North Central Division

OHIO

	No. of Projects	Total Est. Cost
Plans completed	79	$24,416,400
Surveys completed, plans underway	53	28,389,000
Surveys underway	94	81,761,400
Surveys not yet started.	68	52,066,500
Total	294	$186,633,300

INDIANA

	No. of Projects	Total Est. Cost
Ready for bids	..	.....
Plans completed, right of way partially secured	51	$17,150,000
Surveys completed, plans underway	124	41,650,000
Surveys underway	55	18,500,000
Surveys not yet started.	320	107,700,000
Total	550	$185,000,000

ILLINOIS

	No. of Projects	Total Est. Cost
Plans completed, right of way secured	26	$14,401,000
Plans completed, right of way being acquired	19	8,730,000
Surveys completed, plans underway	72	34,582,000
Surveys underway	19	11,920,000
Surveys not yet started.	73	102,960,000
Total	209	$172,593,000

MICHIGAN

	No. of Projects	Total Est. Cost
*Plans completed	60	$11,000,000
Surveys completed, plans underway	190	43,000,000
Surveys underway	50	37,000,000
Surveys not yet started.	220	50,000,000
Total	520	$141,000,000

*Bids could be taken in two weeks on any project listed.

WISCONSIN

The following is a rough estimate of the status of highway projects tentatively programmed and upon which surveys and plans have been authorized as being jobs which could be made a part of a post-war construction program. These figures are in the nature of a very rough estimate only. Surveys on several of the larger expensive jobs involving drastic relocations have been of a reconnaissance nature only, with no possibility of any reasonable estimate being made as to future construction costs. The estimate is about as follows:

	No. of Projects	Total Est. Cost
Plans completed	100	$ 8,000,000
Surveys and plans underway	117	36,000,000
Surveys underway, plans not started	60	24,000,000
Surveys not started	23	7,000,000
Total	300	$75,000,000

West North Central Division

MINNESOTA

The following is the status of the Minnesota Trunk highway post-war program:

	No. of Projects	Total Est. Cost
Plans completed, right of way secured	46	$ 7,000,000
Plans completed, right of way not secured	47	11,000,000
Surveys completed, plans underway	85	18,000,000
Surveys complete	14	3,000,000
Surveys underway	42	4,000,000
Surveys authorized, not yet started	33	8,000,000
Total	267	$51,000,000

IOWA

The accompanying tables show the projects definitely programmed and the projects approved by the State Highway Commission and PRA. It is hoped that by the time permission

is given to proceed with post-war highway construction at least one year's complete program will be ready to let.

Status of projects definitely programmed and approved by Commission and by PRA.

	No. of Projects	Total Est. Cost
Ready for bids	28	$ 2,500,865
Plans completed, right of way secured	2	340,000
Plans completed, right of way not secured	14	791,000
Surveys completed, plans underway	21	1,769,100
Surveys completed, plans not started	2	6,000
Total	67	$ 5,406,965

Status of projects approved by Commission and PRA but not definitely programmed, pending passage of Federal legislation.

	No. of Projects	Total Est. Cost
Plans completed	19	$ 1,935,550
Plans underway	190	17,242,770
Plans not started	138	8,426,650
Total	347	$27,604,970

MISSOURI

Plans complete, right of way secured, and P.R.A. approval received	$6,718,000
Plans complete, right of way secured, and in the process of submission to P.R.A. for additional	7,732,000
Plans complete and right of way in process of being secured for additional	7,303,000
Surveys complete and plans underway on additional	7,373,000
Surveys underway for additional	3,372,000

The estimated cost for definitely programmed work for the first and second post-war years is as follows:

	1st Year	2nd Year
Federal Aid System	$19,400,000	$13,000,000
Secondary and Feeder Roads	7,000,000	7,000,000

NORTH DAKOTA

	No. of Projects	Total Est. Cost
Ready for bids	4	$ 1,201,000
Plans completed, right of way secured	8	2,415,640
Surveys completed, plans underway	59	14,238,240
Surveys underway	6	1,410,000
Surveys not yet started	30	7,155,000
Total	107	$26,419,880

SOUTH DAKOTA

	No. of Projects	Total Est. Cost
Ready bids, plans completed, right of way being secured	36	$ 5,000,000
Surveys completed, plans underway	20	3,000,000
Surveys underway	8	1,500,000
Surveys not yet started	15	3,000,000

NEBRASKA

	No. of Projects	Total Est. Cost
Plans completed	49	$ 6,222,000
Surveys completed, plans underway	108	17,872,000
Surveys underway	25	3,435,000
Surveys not yet started	515	53,599,000

KANSAS

	No. of Projects	Total Est. Cost
Ready for bids	29	$ 5,900,500
Plans completed, right of way not secured	30	5,648,500
Surveys completed, plans underway	100	17,432,500
Surveys underway	7	3,000,000
Surveys not yet started	150	30,000,000

South Atlantic Division

DELAWARE

	No. of Projects	Total Est. Cost
Ready for bids	..	.....
Plans completed, right of way secured	9	$ 1,430,000
Surveys completed, plans underway	13	2,310,000
Surveys underway	7	1,380,000
Surveys not yet started	49	9,880,000
Total	78	$15,000,000

The 9 contracts listed under "Plans completed, right of way secured," can be made ready for bids in 30 days. The figures in this table represent a 5-year program.

MARYLAND

Seven projects, with an estimated cost of $3,316,000, for which plans are complete and rights-of-way secured, and are ready for bids.

Seven additional projects, with an estimated cost of $15,970,000, for which plans are complete, but for which rights-of-way are not entirely secured.

Twenty-two projects, with an estimated cost of $10,031,000, for which surveys are completed, and plans under way.

Four projects, with an estimated cost of $21,960,000, for which surveys are under way.

Thirteen projects, with an estimated cost of $13,495,500, for which surveys have not been started.

This makes 53 projects, with an estimated cost of $64,772,500, which have been programmed.

VIRGINIA

	No. of Projects	Total Est. Cost
Ready for bids	60	$10,000,000
Plans completed, right of way secured	40	6,000,000
Surveys completed, plans underway	100	15,000,000
Surveys underway	50	10,000,000
Surveys not started	100	52,000,000
Total	350	$93,000,000

Projects definitely programmed — 120 (State Allocations)
Total estimated cost $18,000,000

WEST VIRGINIA

	No. of Projects	Total Est. Cost
Ready for bids	26	$ 3,929,500
Plans completed, right of way secured	..	.....
Surveys completed, plans underway	80	29,827,000
Surveys underway	8	3,707,500
Surveys not yet started	75	25,903,000
Total	189	$63,367,000

NORTH CAROLINA

	No. of Projects	Total Est. Cost
Ready for bids	26	$ 3,759,300
Plans completed, right of way secured	16	2,666,600
Surveys completed, plans underway	72	11,866,000
Surveys underway	39	8,600,000
Surveys not yet started	173	51,650,900
Total	328	$78,542,800

SOUTH CAROLINA

	No. of Projects	Total Est. Cost
Plans ready for bids	101	$ 9,910,000
Plans completed, right of way being secured	53	7,268,000
Surveys completed, plans underway	43	13,678,000
Surveys completed, plans not started	74	5,106,000
Surveys underway	7	13,000,000
Surveys not yet started	80	17,921,000
Total	358	$66,883,000

GEORGIA

The state highway department has 138 projects programmed, the total estimated cost of which is $10,835,330.

East South Central Division

KENTUCKY

	No. of Projects	Ttotal Est. Cost
Ready for bids	10	$ 3,000,000
Plans completed, right of way secured	55	8,000,000
Surveys completed, plans underway	37	11,000,000
Surveys underway	23	8,000,000
Surveys not yet started	36	12,000,000
Total	200	$60,000,000

The first part of this tabulation is reasonably close. The Department's program, however, is quite flexible and can be altered almost at will. A wide tolerance, therefore, should be allowed for the total number of projects programmed and the total estimated cost.

TENNESSEE

	No. of Projects	Total Est. Cost
Plans complete and ready with exception of Public Roads Administration approval.	17	$ 2,210,000
Plans ready, no right of way acquired except P.R.A. approval	35	7,018,000
Surveys complete and plans underway, some of which are practically complete	57	13,860,000
Surveys underway or complete; no work on plans	26	8,390,000
Surveys not started	28	6,655,000
Total	163	$38,133,000

ALABAMA

	No. of Projects	Total Est. Cost
*Ready for bids (21.5 miles)	9	$ 840,000
Plans completed, right of way being acquired (10 miles)	2	400,000
Surveys complete, plans underway (175 miles)	22	9,610,000
Surveys underway (150 miles)	15	9,300,000
Surveys not yet started (555 miles)	50	26,000,000

*Also 15 grade crossing signal projects, estimated to cost $75,000.

In addition to the data set out above, the state highway department has submitted to the Public Roads Administration for its approval, another program consisting of 23 projects of a total length of 233.2 miles, the estimated cost of construction of which is $8,700,000. Except for some work which was done on certain of these projects prior to the war nothing has been done toward completing surveys and plans for these projects.

MISSISSIPI

At the present time there are no funds available for construction, and it will be necessary for the Governor to call a special session of the legislature to provide state funds to match Federal funds. There is no doubt that Mississippi will be able to finance the post-war program.

West South Central Division

OKLAHOMA

	No. of Projects	Total Est. Cost
Ready for bids	55	$10,000,000
Surveys completed, plans underway	46	12,668,000
Surveys underway	84	33,000,000
Surveys not yet started	81	30,000,000
Total	36	$ 7,813,000

(*Continued on page* 91)

TWO WAYS TO INSURE A POST WAR FUTURE

HERE'S ONE WAY:—*The Institute of Life Insurance reports leading insurance companies laying plans for another 100 million dollars of housing within 6 months after the war.*

HERE'S THE SECOND:—*U. S. building contractors planning now their purchases of trouble-free Blue Brutes to back their post-war bids.*

That 160′ compressor shown above—just one of many types and models—you'll see displayed in post-war Blue Brute showrooms.

Outside—*looks* fit and strong—but look *inside*. Clean-muscled design, with Feather* Valves (above all imitations, lightest, tightest, quietest), saves hours and dollars downtime. Engine—smooth-running six—start it and hear it hum! And note—both engine and compressor "cradled" by special unit coupling in 3-point suspension, safe from vibration, shock, distortion.

For earth work, gas lines, light lines, drains, you'll want that Blue Brute Backfill Tamper too (the W-8)—to save hand-tamping time; rugged but easy-handling, made of special steel.

In brief, with these Blue Brutes, you've got an air-power team that saves construction costs. Your nearest Blue Brute distributor is listed on page 85.

*Reg. U. S. Pat. Off.

PC 4-19

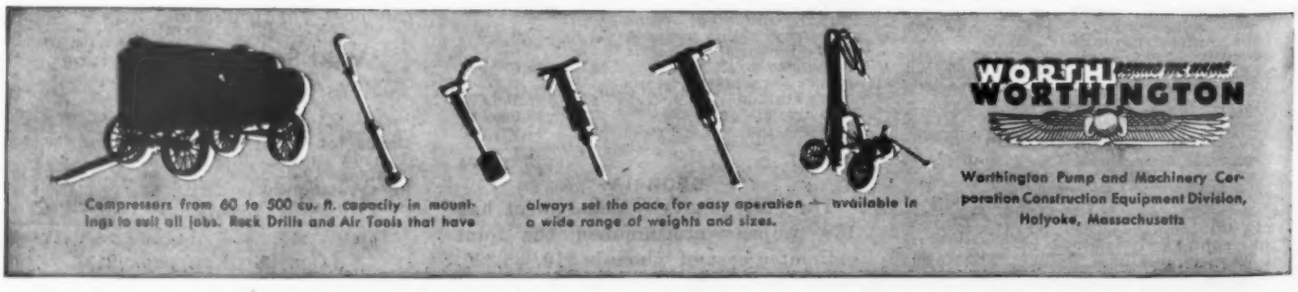
Behind the Fighting Fronts with

BLUE BRUTES

On a midwest construction job, contractor reports: "Five Blue Brute compressors in service 6 months, untouched except for oil change"—and the same top-notch performance makes Blue Brutes pay, on fighting supply lines here and overseas, camps, Navy yards, air bases, ordnance plants. Will save *you* time and cash post-war.

Get more WORTH from air with WORTHINGTON

BUY BLUE BRUTES



Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have always set the pace for easy operation — available in a wide range of weights and sizes.

WORTH
WORTHINGTON

Worthington Pump and Machinery Corporation Construction Equipment Division, Holyoke, Massachusetts

Here Is Your Nearest Worthington Distributor

For Sales, Rentals and Service on BLUE BRUTE Portable Compressors, Rock Drills and Air Tools.

See full page ad page 84

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ARIZONA
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NEW JERSEY
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Roswell—Smith Machinery Co.

NEW YORK
Albany—Larkin Equipment Company
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WEST VIRGINIA
Fairmont—Interstate Engineers & Constructors

WYOMING
Cheyenne—Wilson Equipment & Supply Co.

Get more WORTH from air with WORTHINGTON

Blue Brute

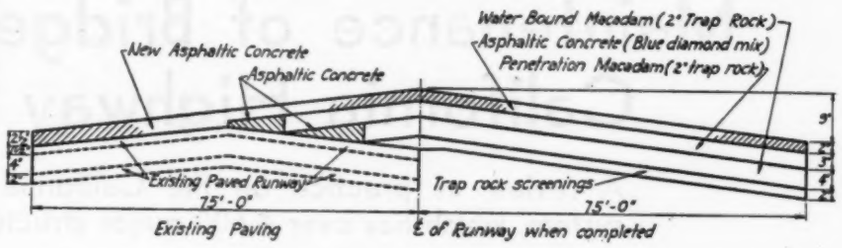
Worthington Pump and Machinery Corp.

E. B. McGurk, Inc., Completes Modern Private Airport at East Hartford

NOW one of the largest private airports in the country, Rentschler Airport at Hartford, Conn., was extensively improved during 1944 to meet latest requirements for testing of planes.

Under contracts with United Aircraft Corp., Pratt & Whitney Aircraft Div., owner E. B. McGurk, Inc., of Hartford, cleared and grubbed the expansion area and put in three asphalt runways, each about one mile long and 150-ft. wide. Grading and concrete turnarounds were done under subcontract by A. I. Savin Const. Co. of East Hartford.

Aided by good weather McGurk finished ahead of schedule, placing as high as 2,750 tons of stone and screenings and 600 tons of hot-mix in a 9-hr. day. Over 185,000 tons of stone went into the rolled layers and apron concrete, delivered from two quarries 8 miles distant. New Haven Traprock Co. supplied 35,000 tons of hot-mix 120-150 pen. asphalt; and a 2-in. wearing surface of hot-mixed, hot-laid asphaltic concrete. One of the smooth rollers on runway compaction was equipped with a 10-ft. broom in the rear to mulch stone dust as rolling progressed ahead of schedule.



TYPICAL SECTION THRU RUNWAY WHICH IS TO BE WIDENED & REINFORCED. SECTION TO RIGHT OF ℄ IS TYPICAL OF NEW RUNWAY DESIGN.

Drainage was a special problem due to large ground underlain by an impervious clay stratum which created a high water table. Perforated, corrugated metal asphalt coated pipe was used for approximately 28,000 lin. ft. of storm drains and collectors. Perforations over 50% of the diameter were placed down for stone-filled surface collectors and on sides for ground water collection. Drainage also included approximately 1,800 ft. of 60-in. concrete pipe. The flat field required 700,000 cu. yd. of shallow grading. Clearing and grubbing was a tough task. Seventy men with saws and axes worked at the dense growth of medium-sized hardwood. Winches, shovels and dozers pulled stumps, aided by blasting as winter set in.

The upper 6 in. layer of backfill for 30-in.-wide drains installed at pavement edges was specified to consist of 2½-in-max. open stone, coated with RC2 or MC2. Stone was coated in a 1-sack concrete mixer, placed with wheelbarrows and spread with only light rolling.

The new runways were built 11 in. thick, the cross section including 2 in. of rolled rock screenings; 4 in. of stone macadam chocked and thoroughly rolled; 3 in. of penetration macadam using 1½ gal. per sq. yd. of from their Plainville and Branford plants.

Rentschler Airport improvements were designed and supervised by the Austin Engineering Co., Frank Scerca, resident engineer. G. E. Tranberry, assistant manager of the airport, was in charge of construction for Pratt & Whitney Aircraft Division.

▼

Michigan Group Favors Gas Tax Increase

Should more highway revenues be needed in Michigan, the Michigan Farm Bureau has gone on record favoring an increase of the gas tax from the present 3c to 4c a gallon. As stated at its recent annual meeting, the Bureau's statement is published as follows: "Adequate financing has never been provided for those roads taken over by the counties from the townships under the McNitt act. Revenues available for highway purposes have been drastically reduced, occasioned principally by the lower receipts from gasoline taxes. Higher wages have increased the expense of maintenance and construction. We favor a fair allocation of funds between primary and secondary roads."

Illustration 1

Maintenance of Bridge Floors on California Highway System

A review of practice on the California state highway system, which has over 4,600 major structures to maintain

By HARVEY D. STOVER
Bridge Maintenance Engineer, California Division of Highways, Sacramento

THERE are 4,636 bridges on the California State Highway System omitting culverts—3,142 of steel and concrete, 1,394 of timber or steel with timber approaches and 100 of steel. The estimated value exclusive of State-owned toll bridges is $125,000,000.

The protection of this investment and the maintenance of the bridges in such condition that they will best serve the traveling public is a duty of the Bridge Department of the Division of Highways. Within the Bridge Department, maintenance work is handled directly by the Maintenance and Research Section. Methods of repair and maintenance as developed and field tested by this section over a number of years have included several practices that are worthy of note and should be of interest to the engineers and construction men engaged in this work throughout the country.

In the maintenance of timber bridges and old steel bridges, the floor is the most vulnerable portion of the structure and requires first attention. This is due to the fact that the bridge deck is directly subjected to traffic damage, and wheel concentrations have increased beyond the original design load in many cases. Reconstruction of a bridge floor is usually governed by two major considerations; the first is the dead load which may be permitted by existing trusses or other structural members, and the second is the estimated remaining service life of the structure before complete replacement will be necessary.

In general, there are three types of floors being used on the maintenance of bridges:

1. Reinforced concrete.
2. Open steel grating.
3. Double diagonal treated timber with a suitable wearing surface.

A reinforced concrete floor is used where the existing structure can safely support this relatively high dead

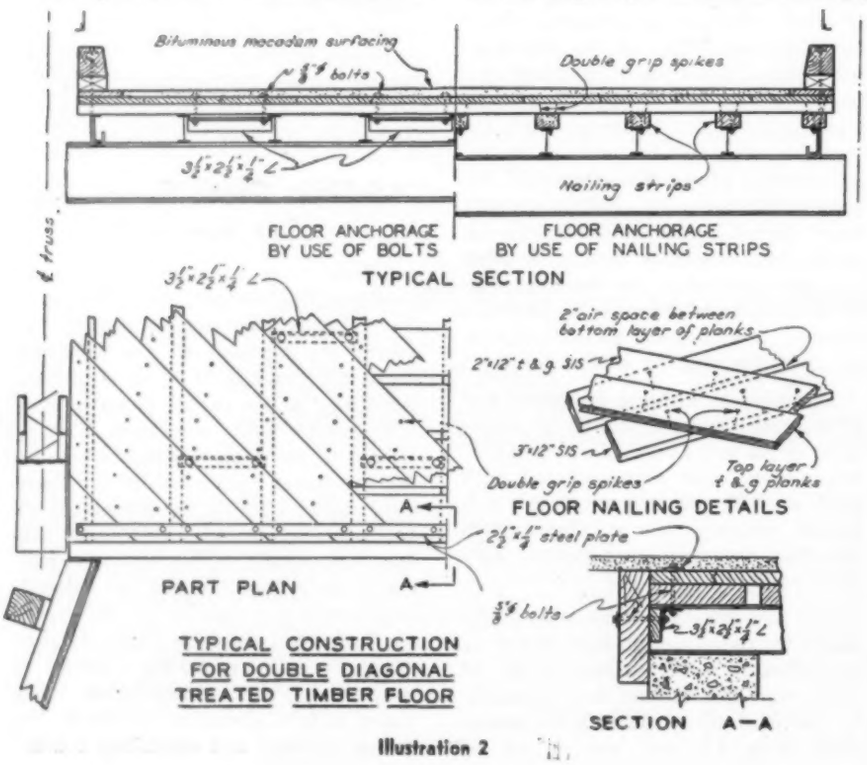

Bituminous macadam surfacing
Double grip spikes
Nailing strips
FLOOR ANCHORAGE BY USE OF BOLTS
FLOOR ANCHORAGE BY USE OF NAILING STRIPS
TYPICAL SECTION
2" air space between bottom layer of planks
Double grip spikes
Top layer t & g planks
FLOOR NAILING DETAILS
PART PLAN
SECTION A—A
TYPICAL CONSTRUCTION FOR DOUBLE DIAGONAL TREATED TIMBER FLOOR

Illustration 2

To all business,

large or small...

Postwar business competition is going to be tough. Whether your trucks *make or lose money* for you is going to be more important than ever before.

Today in wartime, the lack of new civilian trucks has thrown a revealing light on the performance and stamina of every make of truck in the United States. Right now is the time to dig into all the facts as they exist—to find out which trucks are standing up best under the toughest conditions trucks have ever had to face.

Now is the time to determine which trucks will do YOUR job in the BEST possible way, at the LOWEST COST during the years ahead.

The phrase "Built like a Mack truck" got into the language because of something real that is *built* into Mack trucks.

Step by step—in materials, design and workmanship—they are deliberately built to work harder—last longer—require less repair than any other truck you can buy.

This is not a "claim," but a fact! It is backed by the records of thousands of wartime Mack owners who have seen Mack's better construction pay off at a time when it was needed most.

They will tell you—in no uncertain terms—that the man who owns a Mack is lucky, and the man who plans to get one is wise.

Essential civilian users can now secure Mack trucks. Ask your nearest Mack branch or dealer for details.

Mack

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PERFORMANCE COUNTS

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Illustrations 3, 4 and 5

load, and the estimated remaining life of the structure warrants this type of construction. The use of open steel grating has generally been restricted to the lift spans of moveable bridges where the counter weights and machinery required that the dead load weight be kept to a minimum, and has further been restricted to those locations not subjected to the movement of loose livestock.

The treated timber floor as described above is used where light truss designs will not permit a heavy type traffic and on moveable bridges in those locations where provisions must be made for the passage of livestock, which latter condition is generally the rule throughout the central valley and mountain regions of California. Where light design, narrow width or poor alignment of the bridge wall require structure replacement within a relatively few years, an untreated timber floor is generally used.

Floors on Steel Bridges

The reflooring of the Feather River Bridge at Oroville, State Route III-BUT-87-A, shown in illustrations Nos. 3 to 5, embraces unusual features worthy of note. The structure was built by Butte County in 1907 and had been posted for restricted loads since being incorporated into the State Highway System in 1933. Posting was required due to the light design of the floor beams and the stringers, although the truss members were adequate for legal loads.

The floor consisted of an asphaltic wearing surface on steel buckle plates riveted to the top flanges of the steel stringers. Longitudinal joints between the buckle plates were connected by rivets through a narrow steel splice plate. These splice plates were too thin to withstand the heavier wheel loads of modern traffic, and as a result rivet holes pulled out of round and the rivets worked loose, causing excessive deflections in the deck and breaking up the surfacing. This condition resulted in continual maintenance and in time would undoubtedly have resulted in complete floor failure.

A reinforced concrete floor was placed, utilizing the present buckle plates for forms. Since the truss system was adequate, it was desirable to increase the strength of the stringers and floor beams to provide for full legal loads.

Economical Design

In order to correct the condition of the light stringer design, consideration was given to respacing the stringers and adding additional lines. This method would have required the removal of the buckle plates and forming of the complete floor area for placing the concrete. A more economical design was accomplished by removing the rivets which secured the buckle plates to the top flanges of the stringers and replacing them with bolts and double nuts, permitting the head of the bolt to extend several inches up into the concrete slab. This method provided sufficient shear connections between the steel stringers and the concrete slab to allow the deck to function as a composite.

Reference is made to Illustration 2 which shows typical details for treated timber floors now being used on steel trusses. As noted in the illustration, the floor block is secured to the steel stringers with double grip spikes extending into nailing strips which are bolted to the top flange of the stringers. In many instances, the original design did not use nailing strips in which case the planks are bolted down by using short pieces of angles, which are cut to proper length and extend between the webs of the steel stringers, and thus anchor the floor to the top flange.

Other features of the design consist of spacing the bottom layer of plank sufficiently far apart to provide space for ventilation and the use of tongue and groove top layers, which to some extent prevent the surface from cracking at the joints, thus preventing moisture from entering the floor planks and stringers, all of which tend to prevent decay of the timbers. This type of floor has been used on a considerable number of bridges during the past few years and is giving satisfactory service.

Although there is little to substantiate the statement that diagonal planking provides better distribution,

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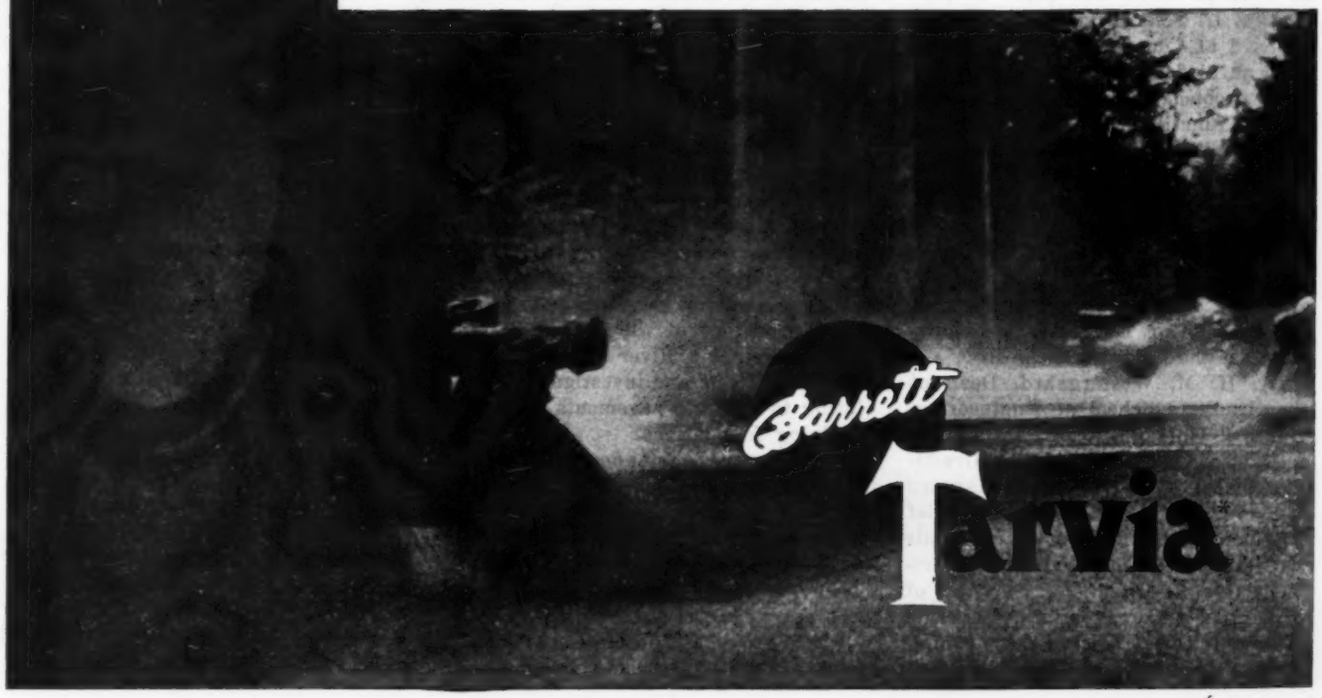

it does have a very definite value in reducing impact, due to the fact that both wheels of an axle do not strike the same plank at once. This type of floor is often used on old steel bridges having timber stringers, in which case the floor is nailed directly to the stringers, the latter being replaced as required at the time the floor is layed. A typical example is shown in Illustration 1.

Floors on Timber Bridges

The type of floors being used on timber bridges are either reinforced concrete slab or treated timber of the design above mentioned, providing the balance of the bridge is in good condition and on permanent alignment.

Due to the relatively large percentage of timber bridges in the State System, a large amount of floor maintenance and reconstruction work is required each year. During the past two year period 104 timber structures were refloored with reinforced concrete slabs cast on sheet metal forms which were nailed to the tops of the timber stringers. In addition, 32 structures were refloored with conventional diagonal timber construction, the choice of type being governed by the condition or estimated remaining service life of the structure. This work was required in some instances due to the decay of the original timber floor, but in the majority of cases, replacement was necessary as a result of failure under the pounding of a large volume of heavy traffic. An average of 20 per cent of the stringers in the above noted work required replacement which had failed in diagonal shear or as a result of a poor grade of lumber at the time of installation.

Reinforced Concrete Bridge Floor

A considerable number of the floors of concrete bridges in the highways system have required attention. Uneven riding surface resulting from plastic flow of the concrete is the most common cause, which is corrected by placing a leveling course of bituminous macadam surfacing.

In certain localities, concrete bridge floor failure has occurred as a result of frost action, spalling the surface resulting in unsatisfactory wearing surface and in some instances exposing the reinforced steel. Maintenance in these instances, has been taken care of by use of bituminous macadam wearing surface, properly placed to provide a true riding surface.

Airfield Development and Design Problems Under Study by Army

REALIZING that the increasing weight of military airplanes, and the consequent increasing cost and difficulty of airfield construction, will necessitate the continuation of pavement and other design studies on a large scale, the Chief of Engineers, U. S. Army, has established a Board of Consultants to advise his office on airfield development and design problems, and has delegated specific functions in airfield development studies to various laboratories in the Engineer Department.

The Board of Consultants, composed of nationally prominent engineers in the fields of pavement and soil mechanics, with the Chief of the Engineering and Development Division, Office Chief of Engineers, as chairman, has the following members:

Dr. H. M. Westergaard, Dean of the Graduate School of Engineering, Harvard University; Dr. Arthur Casagrande, Associate Professor, Graduate School of Engineering, Harvard University; Mr. J. L. Land, Chief Engineer of the Bureau of Materials and Tests, Alabama Highway Department; Mr. Fred C. Lang, Engineer of Materials and Research, Minnesota Highway Department (Member, Executive Committee, Highway Research Board); Mr. O. J. Porter, Senior Engineer of Materials and Tests, California Highway Department; Mr. T. A. Middlebrooks, Civil Works Division, Office Chief of Engineers.

The specific functions delegated to Engineer Department laboratories in airfield development studies are as follows:

The *Flexible Pavement Laboratory*, which is a part of the Embankment Foundation and Pavement Division of the U. S. Waterways Experiment Station at Vicksburg, Mississippi, will coordinate tests and investigations relating to bituminous pavements and underlying foundations.

The *Rigid Pavement Laboratory*, which is a part of the Cincinnati Testing Laboratory of the Engineer Department's Ohio River Division, will coordinate tests and investigations relating to concrete pavements and underlying foundations.

The *Frost Effects Laboratory*, which is a part of the Soils Laboratory of the U. S. Engineer District Office, Boston, Massachusetts, will coordinate tests and investigations relating to behavior of subgrades and base courses subjected to frost action.

The U. S. Engineer Department, which is the civil works agency of the Corps of Engineers, was given the responsibility for Military Airfield Construction during the latter part of November 1940. The problem which faced the Department at that time was, broadly, to provide consistent and adequate criteria for the layout of airfields and for the design of drainage and pavements. Since there was no other data available, the Department had to adopt the principles of highway practice for the design of pavements and drainage. However, these principles were not entirely adequate for airfield design. While in the beginning a wheel load of 15,000 lb. was the basis of design in contrast to a highway load rarely exceeding 9,000 lb., the wheel loads of military airplanes have increased progressively to 60,000 lb., with still heavier loads expected in the immediate future. The distribution of traffic on runways, too, does not follow the highway pattern. Also, the broad expanse of paved areas with intermediate unpaved areas presents a considerably different drainage problem.

The progress which has been made since 1940 is the result of large-scale and broadly conceived experimentation, intensive investigation of the experience of the department and other agencies, and close liaison with the army air forces. The investigations have included experimental tests to determine the effect of repetitions of loads on various types and thicknesses of pavements, which have led to the tentative adoption of design curves and the correlation of test data to substantiate their validity.

The service behavior of airfield drainage systems is being currently observed by several of the departpartment's field offices; and the reports are being studied by the Office Chief of Engineers with the view of improving design criteria on the basis of experience.

The problem of airfield layout, as to length, width, and grades of runways; location of taxiways; dimensions of safety zones; and related factors, is under intensive review and restudy jointly by the Office Chief of Engineers and the Army Air forces.

The resources which have been brought to bear by the Office Chief of Engineers on airfield design problems have been adequate to keep abreast of aeronautical development to date; and the wealth of information gained, together with the organization established to continue the investigations and developments, should have an important bearing on the airfield design of tomorrow—since military airplanes to a large extent are influencing the type of commercial plane of the future.

(*Continued from Page* 83)

The projects definitely programmed are those based on unused Federal funds to the credit of the state. Federal funds from the new Postwar Federal Aid Bill have not yet been apportioned out to the states and cannot yet be definitely programmed.

Mountain Division

MONTANA

	No. of Projects	Total Est. Cost
Ready for bids	43	$ 7,000,000
Surveys completed, plans underway	47	13,000,000
Total	63	$15,000,000

IDAHO

	No. of Projects	Total Est. Cost
Ready for bids	8	$ 1,870,000
Surveys completed, plans underway	15	4,080,000
Surveys underway	26	7,645,000
Surveys not yet started	13	3,510,000
Total	62	$17,105,000

WYOMING

The state highway department has plans ready for immediate post-war construction of 10 projects, at a total estimated cost of $2,480,000. In addition plans have been completed for 15 projects, to cost $2,000,000, and plans are to be completed within 6 months to 1 year on 20 additional projects, to cost $3,000,000.

COLORADO

Estimated cost of state highway and bridge projects ready for letting as of Dec. 1, 1944	$ 9,900,000
Estimated highway mileage ready for letting as of Dec. 1, 1944	215
Estimated cost of state highway and bridge projects ready for letting as of Dec. 1, 1945	$24,500,000
Estimated highway mileage ready for letting as of Dec. 1, 1945	410

NEW MEXICO

Ready for bids (67.3 miles)		
Surveys completed, plans underway (561.2 miles)		
Total projects definitely programmed	47	
Total estimated cost		$19,000,000

ARIZONA

	No. of Projects	Total Est. Cost
Ready for bids	10	$ 2,100,000
Plans completed, right of way secured	14	3,900,000
Surveys completed, plans underway	50	13,000,000
Surveys underway	18	3,900,000
Surveys not yet started	18	2,100,000
Total (3-yr. program)	110	$25,000,000

UTAH

	No. of Projects	Total Est. Cost
Ready for bids	7	$ 966,700
Plans completed, right of way being acquired	6	2,553,800
Surveys completed, plans underway	32	11,644,200
Surveys underway	19	10,282,050
Surveys not yet started	12	10,291,800
Total	76	$35,738,550

NEVADA

	No. of Projects	Total Est. Cost
Plans ready for bids	6	$ 2,662,000
Surveys completed, plans underway, and right of way being secured	9	3,160,000
Surveys underway	5	1,430,000
Total	20	$7,252,000

(*Continued on page* 95)

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have the quality features that assure you of dependable service

On one tough job after another, famous Le Roi Compressors back up your reputation for on-time performance — because they're built with the quality features that stand up under severe operating conditions.

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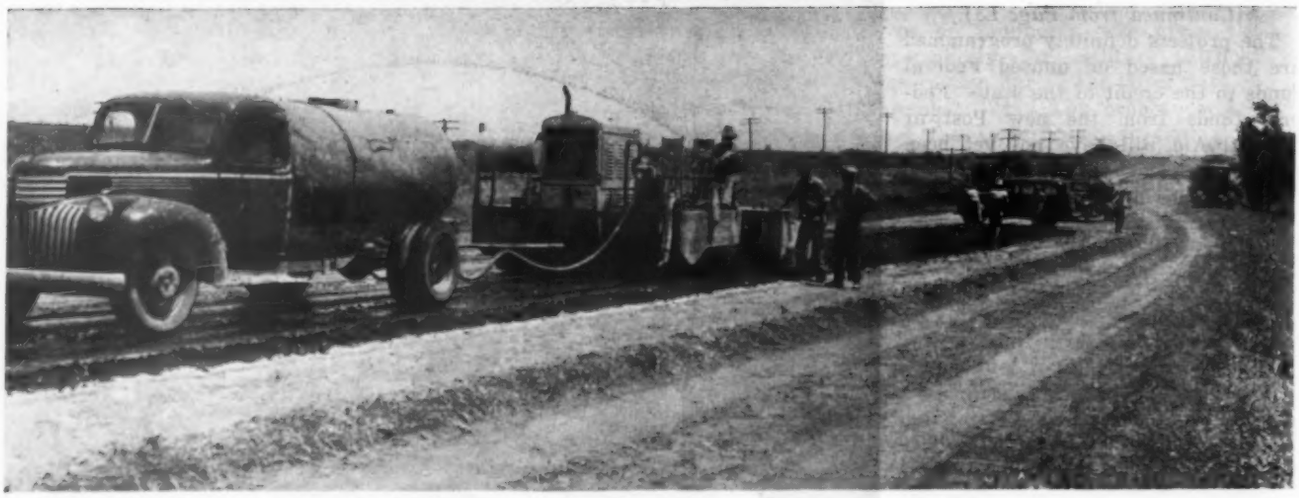

Old Caliche Road Rebuilt with Soil-Cement

SECTIONS of old caliche roads in the Texas panhandle have been reconstructed economically with soil-cement, according to James G. Lott, district engineer, Texas Highway Department, Amarillo. This work has been done by stabilizing the full width of the roadway throughout designated sections where numerous failures have developed in the old bases. Upon completion of the soil-cement processing an asphaltic topping was placed full width.

Soil-cement was first used in 1939 for two short stretches, totaling about one mile in length on U.S. 87 in Dallam County and U.S. 287 in Donley County. This work was performed by the mixed-in-place method of soil-cement construction.

Then in 1942 following three years of observance of the satisfactory performance of these sections, about twelve miles of additional roadway length was processed in stretches from a fraction of a mile up to six miles in length, all of this work being on U.S. 287 in Donley and Armstrong Counties. The work of that year was performed by the use of a leased Flynn machine.

Briefly, our procedure in 1942 work was as follows:

1. Old asphalt surface pulverized with Flynn machine and bladed to shoulders.

2. Existing base scarified pre-wet to slightly below optimum moisture content, and rebladed to correct section.

3. Cement hand spread and mixed into base by Flynn machine. Sufficient additional water added to mixture through the machine to bring to optimum.

4. Base compacted by use of sheepsfoot roller, bladed to final section and finished with pneumatic roller.

5. The completed base was primed and asphalt surface placed.

Navy Needs Construction Engineers

RECENTLY the U. S. Navy announced the reopening of officer procurement for the Construction Battalion. This program has been closed for over nine months and has reopened with the highest priority rating—No. 1.

The splendid mark established by the Construction Battalion, more popularly known as the C.B.'s (Seabees), should be an inducement for scores of construction men to volunteer for this duty. Without the successful effort of these men now serving in the Seabees, our fleet could not be where it is today. Now, increased effort is necessary for building many new bases, landing fields, and harbors. The further our Navy, Army, and Marines go in the Pacific, the greater the need for more construction becomes.

The Navy wants and vitally needs qualified engineers who will be capable of organizing and directing this work. Preference is for men under thirty-eight (38) years of age, although in some cases the age limit extends to fifty (50) years.

Many engineers are needed—civil, electrical, as well as construction, and all men who are not presently employed in essential industry are urged to visit their nearest Office of Naval Officer Procurement to see if they can qualify for this highly important and responsible work.

Applicants under thirty-five (35) years of age must have a degree in Civil Engineering from an accredited college, plus several years of experience in field construction work. Men between 35-50 years of age who do not have a college degree will be considered providing they have at least 10-15 years of experience in responsible charge of construction work. Those men over 35 years of age who do not have a degree and who have less than 10-15 years of supervisory experience may be considered for warrant officer appointment.

Men who are not themselves eligible because of age, or physically disqualifying factors, are asked to direct men who are eligible to the Navy or to consider releasing men in their employ who are able to qualify. Candidates are asked to visit or write to any one of the Offices of Naval Officer Procurement listed below:

ATLANTA, Georgia, 321 Healey Bldg.
BOSTON, Mass., 150 Causeway Street
CHICAGO, Ill., 141 W. Jackson Blvd.
CINCINNATI, Ohio, 9th Floor, Enquirer Bldg., 617 Vine Street
DETROIT, Mich., 5th Floor, Book Bldg., 1249 Washington Blvd.
KANSAS CITY, Mo., 202 Finance Bldg.
MINNEAPOLIS, Minn., 1645 Northwestern Bank Bldg.
LOS ANGELES, Calif., Title Guarantee & Trust Co., Bldg., 411 W. 5th Street
NEW ORLEANS, La., International House Bldg., 611 Gravier Street
HOUSTON, Tex., 825 Niels-Esperson Bldg.
NEW YORK, N. Y., 33 Pine Street
PHILADELPHIA, Penn., 17th Floor, Widener Bldg., Juniper and Chestnut Streets
PITTSBURGH, Penn., Keystone Hotel Bldg., Third Ave. and Wood Street
RICHMOND, Va., 5th and Cary Streets
SAN FRANCISCO, Calif., 703 Market Street
SEATTLE, Wash., 117 Marion Street
WASHINGTON, D. C., 1320 G Street, N.W.

Seabees Mark Third Anniversary

On December 28 the "Seabees" became three years old. Vying with the Corps of Engineers as the "workingest, fightingest bunch of men" in our armed forces, this group lit no candles but were savagely busy on many fronts leveling hills, clearing jungle paths, draining swamps, constructing landing fields, pontoons and piers.

On Pacific islands and on divers fronts in Europe they will be building or repairing the roads over which American men will fight the war.

The Seabees grew out of the experience of the Navy with civilian workers at Wake and Guam. Some 1400 men, employed strengthening those two bases, fought without military training in their defense. Their need for training was obvious. Three weeks to the day after Pearl Harbor the Navy, with 3300 men enrolled, organized its first worker-fighter units.

The unit's growth has been meteoric, its ingenuity and fortitude a legend in the naval service. Without fanfare or glamour today they number 8,500 officers and 23,400 men, drawn from 60 trades. The Seabees have accomplished engineering near-miracles.

In five weeks on the Normandy beaches they landed 23,000 heavy vehicles and 130,000 men. They repaired a carrier under fire in the South Pacific. At Tarawa they had an airfield in commission, fliers taking off, four days after their first landing. One Seabee battalion, fighting torrential rains and Jap bombs, made a springboard for the attack on New Guinea by carving an airfield in dense tropical jungle in 13 days, in 11 of which 16 in. of rain fell.

Their slogan is "Can Do!"

Average Age is 31

Equally adept with gun or bulldozer (one Seabee, Aurelio Tassone of Milford, Mass., killed 12 Japs in a pillbox with his bulldozer), the Seabees fix and fight, build and defend. It is their own boast they are "the first to land, the last to leave."

Recruiting for the Seabees, shut off for more than a year, began again in November. Welders, concrete workers, carpenters, machinists, electricians, crane operators and other craftsmen from 17 to 50 are eligible, ratings (ranging from apprentice seamen to lieutenant commander) depending on construction experience and artisan ability.

The average age of Seabees is 31. This condition was a source of much chiding at the hands of young Marines

(*Continued on page* 95)

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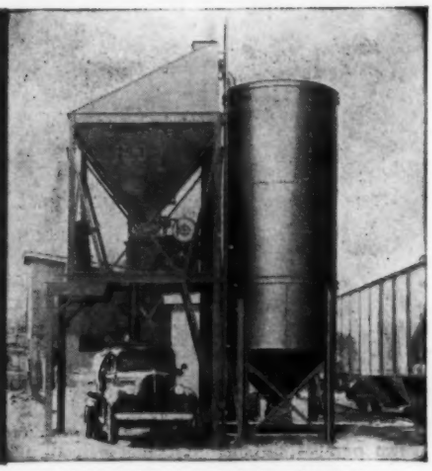

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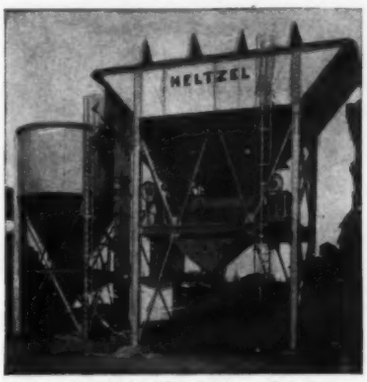

A typical Heltzel Truck Mixer Charger—600 ton Batching Bin—1200 bbl. Bulk Cement Reserve

Steel Curb and Gutter Forms for any cross section on specification

Portable aggregate Batching Bins made by Heltzel in capacities ranging from 30 to 200 tons.

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CENTRAL MIXING PLANTS
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BITUMINOUS PAVING FORMS
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(Left): The device consists of the scarifier tooth shown, followed by two parallel cutting discs, then a small plow which further loosens the material between cutting lines. (Right): Close-up of the cutting discs, which were turned from tough alloy steel in the municipal shop

Cutter for Track Zone Asphalt Repair

The device in action. Pressure on cutting discs is applied by the scarifier controls

THE city forces at Rochester, N. Y., this past summer devised an asphalt strip cutter which proved to be quite a labor saver in patching along the edges of car track zones. The unit is used to trim away a narrow strip of asphalt surfacing along edges of concrete paved zones.

Where double-track zones have been repaved recently, from 10 to 16 ft. width of good asphalt on concrete base has usually been left intact on either side. The asphalt immediately adjacent to the zone is often left an irregular edge despite care in trimming the edges during zone repaving. Or, traffic has worn a groove along this strip.

In either event, removal and replacement of a 3-in. strip of asphalt was found advisable but not enough labor was in sight for a program.

A cutter attached to the roller in place of scarifier teeth leaves a 3-in.-wide groove in the asphalt. Loose material is swept up mechanically

The unit here pictured was rigged up behind a 10-ton roller. It consists of three elements: a surface hardened steel point which rips initially into the pavement, a pair of cutting discs which trim a 3-in. path, and a small plow which further tears out the loosened material.

These three elements, set in tandem, are bolted to the roller scarifier frame in place of the scarifier teeth. Wheels on either side of the discs, set to adjustable height, control the cutting depth. Cutting pressure is applied by the scarifier controls.

The outfit can do 1,000 ft. an hour when cutting on warm days, it is reported, although Topeka mix or any mix on chilly days makes the going tough for the cutting discs. Three men are needed—the roller operator (who also goes back and sweeps up loosened material with a power broom), and two men who draw the chalk lines for the discs and see that the roller operator keeps accurately to the chalkline. A good plate on the roller aids accuracy.

The unit had a workout on about 30,000 lin. ft. of cutting this past summer and is pronounced successful although still having a few "bugs." One problem is to apply enough cutting pressure. The 12-in. diam. cutting discs were made of alloy steel on the municipal shop lathe and hard faced with welding rod. Cutting edges are about 3/16 in. thick and given slightly blunted rather than a knife-blade finish, for strength.

A. H. Wagener is commissioner of public works of Rochester. The cutter described was built in the municipal shop, under Frank Rowe, superintendent of motor equipment, and used in the street program under director of maintenance John V. Lewis and Supervisor John P. Hanoven.

State Highway Construction

(*Continued from page* 83)

In addition to the above, surveys have been completed for projects with an estimated cost in excess of $5,000,000.

Pacific Division

WASHINGTON

	No. of Projects	Total Est. Cost
Ready bids; plans completed, right of way being secured	45	$ 9,000,000
Surveys completed, plans underway	70	15,000,000
Surveys underway	37	7,500,000
Surveys not yet started	92	48,500,000

Definite programs will not be formulated until available funds are definitely known.

OREGON

	No. of Projects	Total Est. Cost
Ready for bids	38	$ 8,000,000
Surveys completed, plans underway, right of way being secured	85	20,000,000
Surveys underway	20	4,000,000
Surveys not yet started	30	4,000,000
Total	173	$36,000,000

The above amounts are for a 3-year post-war program with federal funds limited to the amounts authorized by the recently passed Federal Highway Act of 1944. Surveys and plans have been completed for considerably more work than is indicated, but it now appears that much of it will have to be carried over into later years unless larger amounts of federal funds are made available.

CALIFORNIA

	Estimated Construction Cost
Plans and specifications completed, ready for advertising	$53,200,000
Surveys completed, plans underway	16,000,000
Surveys underway	7,000,000
Surveys not yet started	3,800,000
Total estimated construction cost	$80,000,000
Total projects programmed	145

Acquisition of right of way is up to schedule and keeping pace with the preparation of plans, specifications and estimates.

▼

Seabees Make Third Anniversary

(*Continued from page* 93)

in the days of the Seabees' infancy. They have since won the healthy respect of the Marines and the nation. Few better tributes could be paid them than that inscribed on a sign posted on a Bougainville tree:

"So when we reach the isle of Japan, with our caps at a jaunty tilt,
We will enter the city of Tokyo on roads the Seabees built."

▼

Helen Whitaker Accepts New Secretarial Position

Miss Helen Whitaker, well known to road builders as secretarial assistant and recently Acting Executive Secretary of the American Ass'n of State Highway Officials, has accepted a position as Secretary to Hon. Clyde R. Hoey, U. S. Senator from North Carolina.

Miss Whitaker for a number of years was connected with the North Carolina State Highway Commission when Frank Page, one of the pioneer road builders, was chairman. For the past twelve years she has been with the AASHO with offices in the National Press Building, Washington, D. C., in various capacities—first as Secretary to W. C. Markham, then, upon his retirement, as Acting Executive Secretary, which position she filled for more than a year. Since the selection of a permanent Executive Secretary, Miss Whitaker has been serving the Association as Assistant Executive Secretary.

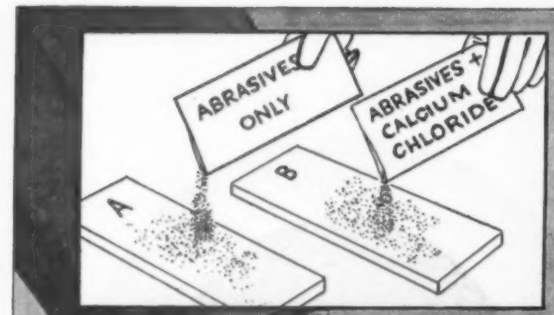
Install KEYSTONE SNOW PLOW LIGHTS now and enjoy the safety that you will have with these flashing warning signals.

Made specially for Highway work in bad weather, they are made to fit your needs, won't shake apart, water can't get in and short them out. They're long lived and a good investment for every Highway Department, large or small.

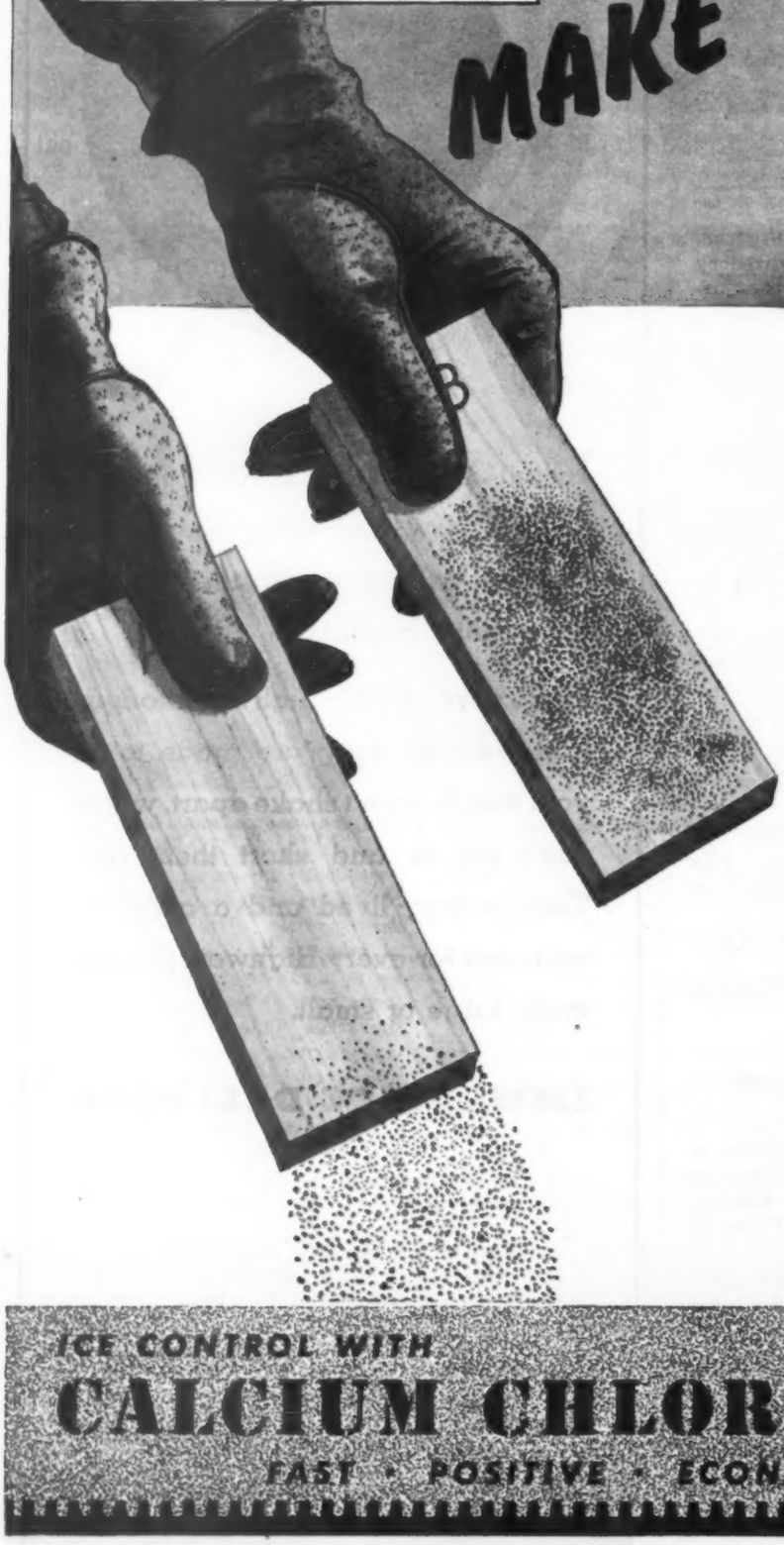
IMMEDIATE DELIVERY

KEYSTONE LIGHTS
FLASH TO FRONT & REAR

AUTO GEAR & PARTS CO.
1410 WEST HUNTING PARK AVENUE, PHILADELPHIA, PA.



MAKE THIS TEST OF ABRASIVE SKIDPROOFING VALUES



The answer to the icy road problem is to get effective skidproofing in the shortest possible time.

Calcium chloride treated abrasives are so widely used because they stick quicker to icy road surfaces. Calcium chloride also serves to keep abrasives unfrozen so they may be loaded and spread easily and rapidly.

You can test the comparative effectiveness of calcium chloride treated abrasives against untreated abrasives very easily. Wet two boards the first cold night to let them freeze to a glare ice surface. Get a handful of abrasives that have been *out in the freezing weather* without treatment and place it on one of the boards. Place a handful of abrasives, treated with calcium chloride, on the other board. Let them alone for five minutes, then tilt the boards. Note how much of each slides off. Then brush them and see how much effective skidproofing material is left.

This test will show why the skid resistance of ½ lb. of calcium chloride treated abrasives per sq. yd. is as much as that of 1½ lbs. of the same abrasives untreated—why you save by treating abrasives with calcium chloride.

Write for Bulletin No. 27, "Skidproofing Icy Roads and Streets," covering methods of application and amounts to use. Calcium Chloride Association, 4145 Penobscot Bldg., Detroit 26, Mich.

ICE CONTROL WITH
CALCIUM CHLORIDE
FAST · POSITIVE · ECONOMICAL

Gears Icy Roads to Tires

Equipment Maintenance

10 Acres of Yard and Shop

The Editor drops in on Basich Bros. Construction Co., one of the "big fellows" in western road and airport building

"BASICH BROS." of Alhambra, Calif., started as just that. Two brothers, Nick (N. L.) and Chris (R. L.).

Like most successful contractors, they began modestly as practical working men. That was about 25 years ago. Today the company is a corporation, George Popovich being firm member along with the brothers. And it can look back on quite a record. A whoppin' mileage of California's state roads, maybe ten million dollars worth or several hundred miles, represents the Basich handiwork during the pre-war years. These take in concrete, plant-mix, road mix, earth moving, in fact just about everything.

When the war construction program came along like a ton of bricks, the firm quickly swung into high gear. Among nine military projects it built the 165-mile road system at Navajo Ordnance Depot in Arizona [article coming soon on methods]. Also nine airport jobs at Yuma and Douglas, Ariz., and Palm Springs, Bishop Vima, Lomita, Victorville, Seeley, Manzanar, Cal., and 50 miles of highway in California. This past season the joint firm of Basich and Price handled a rush drainage and paving job at the marine air base at El Toro, Cal.

During this expanded operation the company made a practice of setting up large, well equipped field shops on its big jobs and doing its own overhauling. Because of the isolated locations and the uncertainty of depending on commercial garages or manufacturers' service facilities during the war, it could do little else. But in the war years the company also built up one of the most modern and self-contained headquarters shops and yard layouts to be found on the west coast. The policy on current and post-war work will be to do light repairing and varying amounts of overhauling in field shops, and draw upon distributors' or commercial machine shops and foundries for some special repairs, but to bring heavy equipment in home when extensive going-over is needed. It has 6 trailers for this purpose, and from 6 to 10 men have been employed recently on transport work.

Modern Home Office

First to catch the eye on visiting the Basich Bros. headquarters is the modern office building. Designed specially to serve their needs, it has a cool, dry concrete basement given over currently to storage of big truck and scraper tires. This scheme affords safety against theft as well as control over temperature and air condition.

The streamlined office quarters, though complete from electric calculating machines to fluorescent lighting, are not luxurious in any sense but do give the visitor a good impression.

"Open Air" Shop 75 x 150 Ft.

The next thing you notice is the spaciousness of the yard, and the fact that the owners think paving should begin at home. Over half of the 10 acres of space consist of a storage park paved with hot-mix asphaltic concrete. The advantages of this pavement are obvious, dust prevention alone being thought to justify the cost. The area is kept noticeably clean, and stored equipment is arranged in neat order.

Along one side of the yard is a 185 x 150 ft. concrete paved area in the center of which sets a 75 x 150 ft. shop building. This provides a 60-ft. loading dock or apron across the California-style open front of the shop, and a 50-ft. apron along the back. In busy times repair work is spilled all over these aprons, which likewise are kept as neat and clean as possible.

The shop proper has no novel features of arrangement, except that stock rooms along the back, having separate entrances, were originally planned one for grader parts, one for tractor parts, etc. Changing needs have required some reshuffling of bin space. Major shop equipment installed to date includes a heavy duty and a small lathe, drill press, 80 ton hydraulic press, portable arc welders and torch outfits, and the usual bench equipment for motor overhauls. A loud speaker system connecting with the office lends a modern note and saves much time and leg work. The shop as yet has no overhead crane system, although this equipment is to be installed soon. Meanwhile pick-up trucks and a truck crane do the necessary handling and toting in and around the shop.

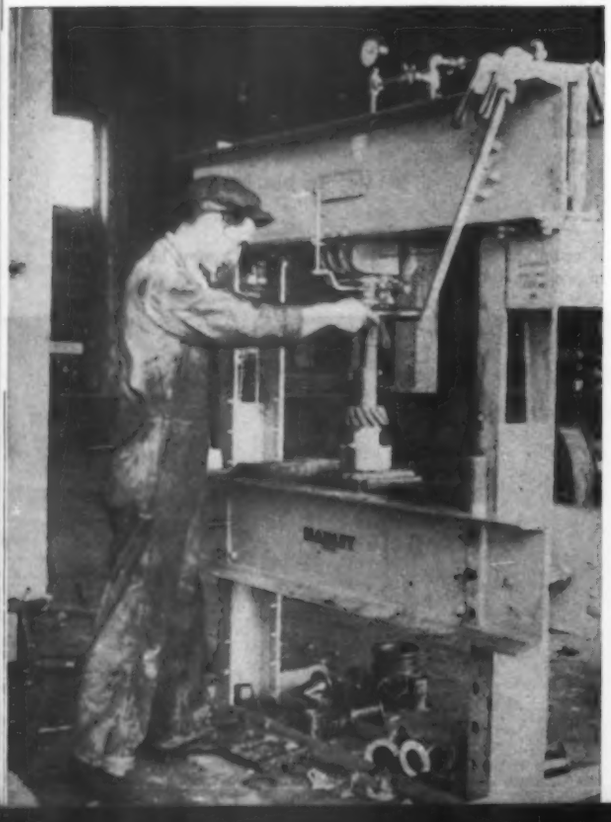
Next to the shop is an outdoor greasing pit, equipped with washing sump and steam rack. Alongside the pit is a semi-portable housed steam

Basich Bros. main shop at Alhambra—"open" to the left and flanked by stock rooms behind the wall at the right

Much of the 10-acre yard area is paved for cleanliness and storage efficiency. Note shop building in background

Back of the shop overhauling and rebuilding work in progress following wind-up of several large military contracts

Use of welding and particularly hardening rod is carried to the practical limit by the Basich Bros. mechanics. These shovel pads have been built up as partially indicated by white lines, and new track pins inserted



Pressing bearing on a pinion shaft for truck. The press has a capacity of 80 tons

Showing arrangement of the steam cleaning rack and sump, alongside the slightly raised platform of a greasing pit (beyond the photo at right)

cleaning outfit to which smaller parts are brought for cleaning.

Post-War Equipment Ideas

Basich executives have several definite notions on the subject of equipment for post-war work. One is that for all their spacious facilities, they don't want to carry too big a parts inventory. (What contractor does?) This spokesman praised one shovel maker which has maintained its own shop in the Los Angeles area and said that the firm would probably find it advantageous to make greater use of distributors' service facilities as and when available. He definitely feels that manufacturers need to offer better parts and repair set-ups in Southern California, however.

Equipment is listed on an inventory form which includes space to note the equipment number, engine number, date acquired, age when acquired, estimated useful life for write-off, purchase cost, rental rate, fire insurance data, license number and fees paid, ad federal stamp number. Equipment inventory as of October included:

10 passenger cars
50 trucks, incl. 12 pick-ups (all used when acquired)
10 flat-bed trailers
45 pieces of air tools (drills, saws, tampers, jackhammers, etc.)
2 power brooms
2 compressors
4 excavators
12 tractors
4 8-ton tandem rollers
3 3-wheel rollers
6 scrapers
4 motor graders
3 crushing plants
12 light plants
2 road mix or traveling plant units
2 semi-portable asphalt plants
2 asphalt spreaders
6 welding machines
2 large buses for transporting employes

As to future equipment needs, this firm hopes to see more development of multi-use units. A versatile piece of equipment that can perform more than one task efficiently, or work under a wide range of conditions, helps keep down the inventory. High fixed costs often offset operating efficiency in units which are too "specialized."

Here's one road and airport builder whose home office has an appearance in keeping with the size and importance of its service

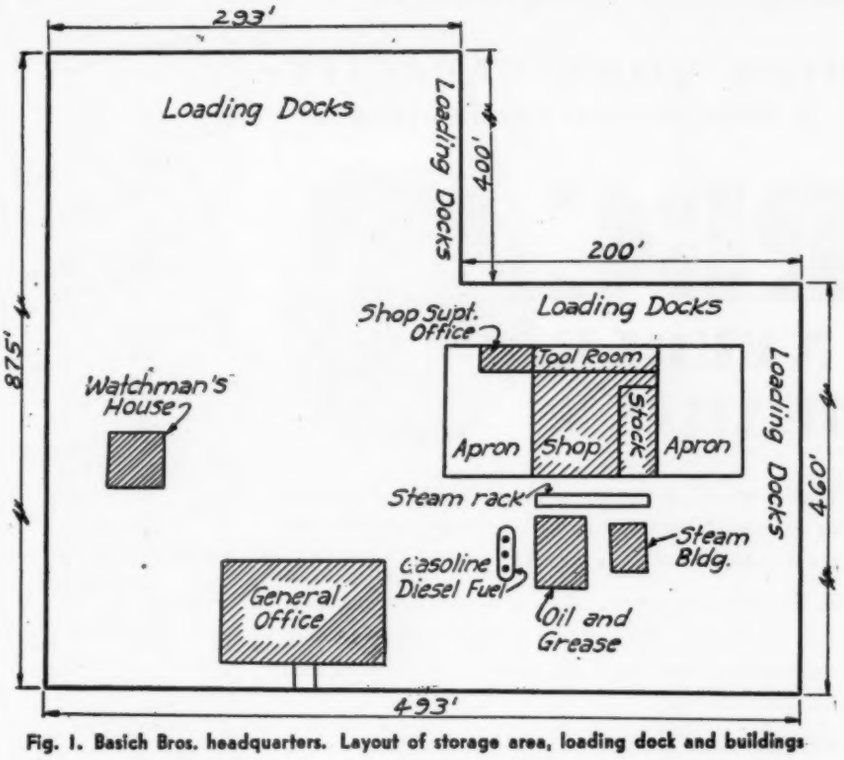
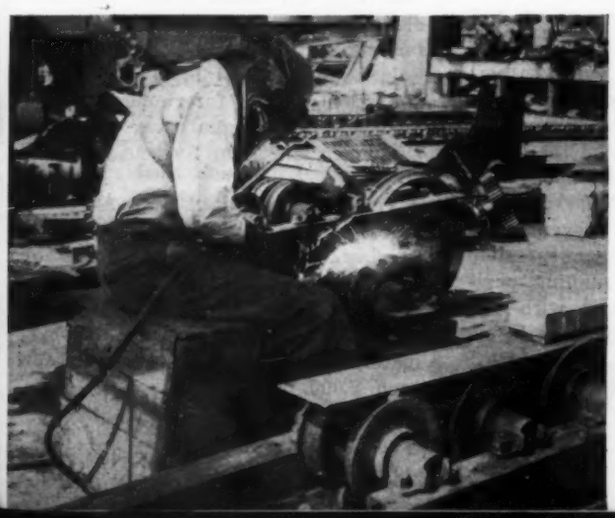


Fig. 1. Basich Bros. headquarters. Layout of storage area, loading dock and buildings

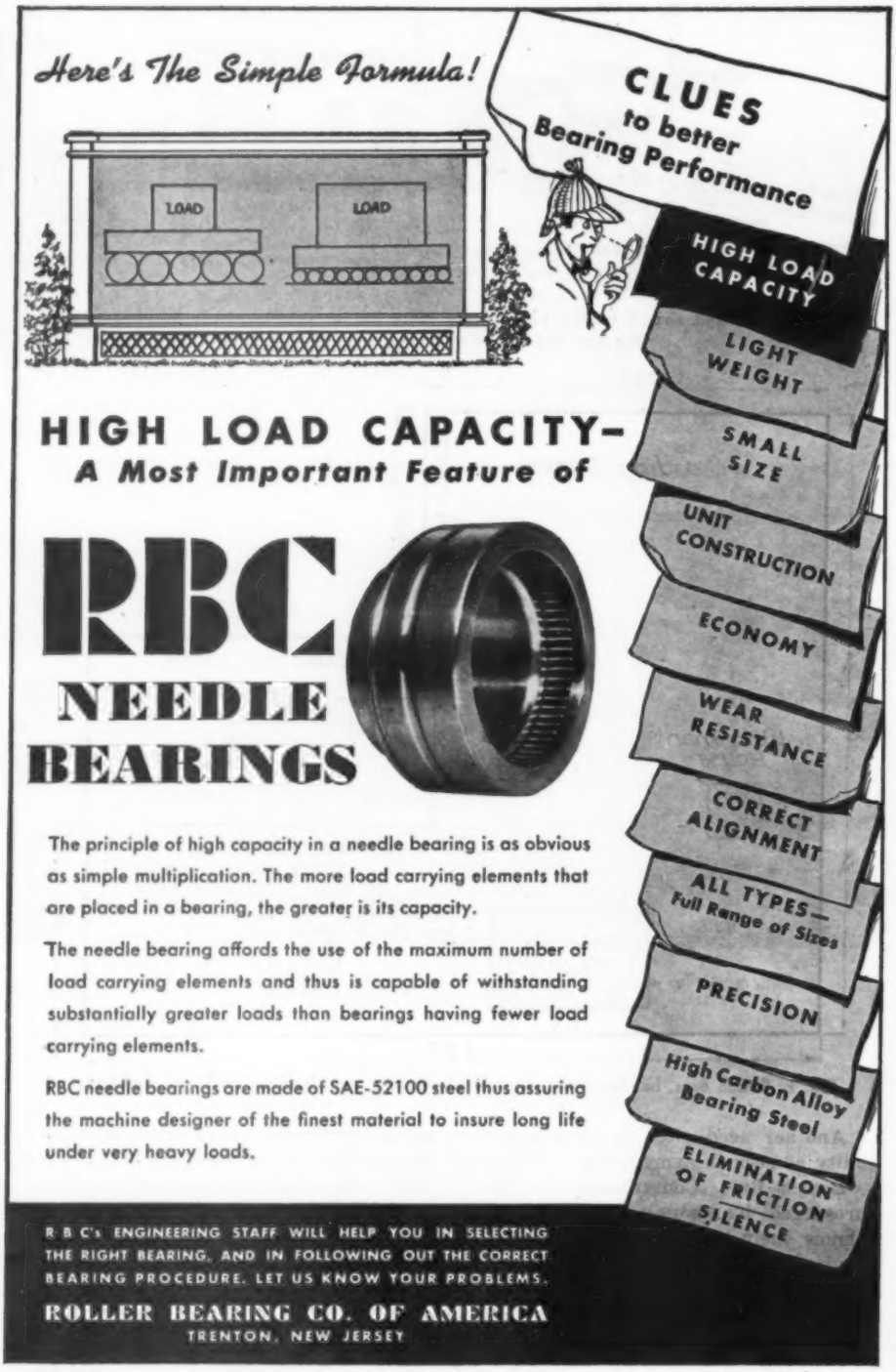
Another need cited is greater mobility as seen in army units.

Basich Bros. Construction Co. has prospered because its principals "know their business." And that includes several kinds of know-how. Nick Basich in particular is equipment-minded. Both brothers have been good organizers. They leave as little as possible to guesswork but have their own individual cost keeping system. They've kept a loyal group of key employes. But the firm knows the value of going the whole route with repairs and servicing to keep equipment in first class condition.

Basich Bros. late in 1944 still found it necessary to build up worn tractor rollers



When washers couldn't be purchased for shovel repair, it didn't take long to make them. Torch operator is shown cutting washers from a piece of scrap plate


Here's The Simple Formula!
CLUES to better Bearing Performance
LOAD
LOAD
HIGH LOAD CAPACITY
LIGHT WEIGHT
SMALL SIZE
UNIT CONSTRUCTION
ECONOMY
WEAR RESISTANCE
CORRECT ALIGNMENT
ALL TYPES— Full Range of Sizes
PRECISION
High Carbon Alloy Bearing Steel
ELIMINATION OF FRICTION
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HIGH LOAD CAPACITY—
A Most Important Feature of
RBC
NEEDLE
BEARINGS
The principle of high capacity in a needle bearing is as obvious as simple multiplication. The more load carrying elements that are placed in a bearing, the greater is its capacity.
The needle bearing affords the use of the maximum number of load carrying elements and thus is capable of withstanding substantially greater loads than bearings having fewer load carrying elements.
RBC needle bearings are made of SAE-52100 steel thus assuring the machine designer of the finest material to insure long life under very heavy loads.
R B C's ENGINEERING STAFF WILL HELP YOU IN SELECTING THE RIGHT BEARING, AND IN FOLLOWING OUT THE CORRECT BEARING PROCEDURE. LET US KNOW YOUR PROBLEMS.
ROLLER BEARING CO. OF AMERICA
TRENTON, NEW JERSEY

Cold Weather Hints

A good hot spark from clean, correctly adjusted spark plugs is essential in cold weather. The ignition system should be checked at the start of the season.

Be sure the lubricating oil is correct for the prevailing temperatures. See page 11-C for oil recommendations.

DRAIN COOLING SYSTEM. Unless antifreeze solution is used, always drain the Cooling System at freezing temperatures. Open radiator, water pump, and water jacket drain cocks.

To start an engine in cold weather, crank one or two revolutions with the choke closed before turning on the ignition switch. Push in the choke half way and open throttle about one-quarter and turn on the ignition switch to start. This prevents extreme flooding. As soon as possible push the choke in to running position. Do not apply load with the choke closed—wait until the engine warms up.

In extremely cold weather, after stopping the engine at the end of the day, it is advisable to drain the oil into a clean container, this oil to be kept in a warm place or heated before being poured into the engine. This will insure easy starting and proper lubrication at once.

This method will also permit the use of summer oil recommendations in winter when load conditions are severe.

Do Not Race a Cold Engine

It is especially important in cold weather to test the specific gravity of the battery. A battery freezes between the temperature 20 degrees above zero and 50 degrees below zero, depending on the state of its charge. Do not add water after shutting down for the night. It will freeze quickly. See that it gets a charge after adding water.

Reproduced by permission from Barber-Greene Company's copyrighted ditcher manual.

▼

Lubrication Engineers Organize

Lubrication engineers representing prominent industrial and transportation companies and educators have organized the American Society of Lubrication Engineers, with headquarters at 135 South La Salle St., Chicago. The officers are: C. E. Pritchard, Republic Steel Co., president; J. C. Peebles, Dean of Engineering, Illinois Institute of Technology, vice-president; B. H. Jennings, Professor of Mechanical Engineering, Northwestern University, secretary and treasurer. Directors include D. N. Evans, Inland Steel Co.; I. L. Harper, Lehigh Valley Railroad; and D. E. Whitehead, Carnegie-Illinois Steel Co.

It is planned to hold the first national convention Feb. 8 and 9 in the Stevens Hotel, Chicago, Ill.

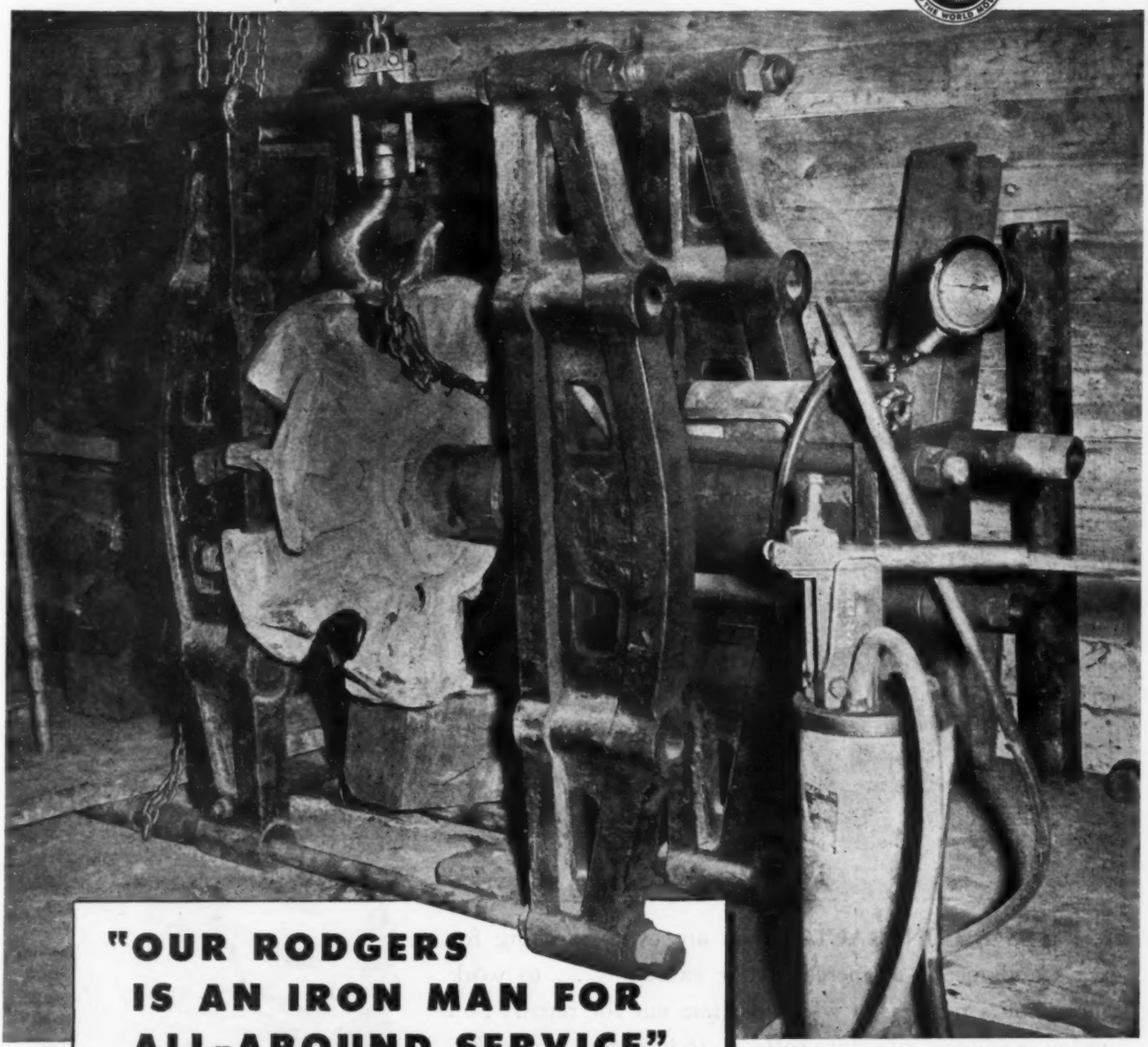
▼

Early Traffic Signals in U. S.—According to the Department of Vehicles and Traffic, Washington, D. C., the first traffic signal in the United States was installed Aug. 5, 1914, at the intersection of 105th St. and Euclid Ave., Cleveland, Ohio. The first electrically interconnected traffic system was installed early in 1917 in Salt Lake City, Utah. The first installation of the forerunner of this modern traffic signal was made in December, 1922, in Syracuse, N. Y.

▼

Traffic Signals in U. S.—A recent research report of the Traffic Engineering and Safety Department of the American Automobile Association, states that a survey of 109 cities indicated that there was approximately one signalized intersection for each 2,000 population.

NO. 23 OF A "READY-WITH-A-RODGERS" SERIES



"OUR RODGERS IS AN IRON MAN FOR ALL-AROUND SERVICE"

Pulling a Diesel shovel sprocket gear at the mine with a Rodgers Universal Press.

"Open-pit iron mining punishes equipment, so our Rodgers Universal Press sees plenty of action. And travel, too — we operate mines miles apart, and shuttle the Rodgers back and forth by light truck.

"We've saved hundreds of hours by taking the press to the job. For example, using the track servicing attachment, we service our crawlers right down in the pit. Both on the job and in the shop, our Rodgers keeps saving us layup time and money on overhauls and repairs."

From the Minnesota iron country comes this report on another Rodgers Universal Press that is doing a whale of a job servicing equipment. The Rodgers Universal can be used wherever portable pulling or pressing power is needed. *If it's a Rodgers, it's the best in hydraulics.* For complete information and prices, write or wire Rodgers Hydraulic, Inc., 7401 Walker Street, St. Louis Park, Minneapolis 16, Minnesota.

***Uses for* RODGERS UNIVERSAL HYDRAULIC PRESS**

Gear Pulling • Wheel Press Work • Jacking Pipe • Erecting Machinery • Relocating Machinery • All-Purpose Jack

RODGERS HYDRAULIC, Inc.

INCREASE YOUR YARDAGE with Firestone TIRES

AS A CONTRACTOR you are ever searching for ways and means to increase your yardage . . . to work more hours per season with less time out for repairs . . . to lower your maintenance costs . . . *to increase your profits.* Today your answer lies in power-driven equipment mounted on Firestone tires.

These big, tough, rugged tires make the operation of modern earthmoving equipment more profitable. Firestone, the pioneer builder, has the advantage of more extensive research and actual field service to build a tire to do your job better. Their strength and quality keep them on the job longer. That is why, with Firestone tires on your equipment, you can move earth at the lowest cost.

Listen to the Voice of Firestone with Richard Crooks and the Firestone Symphony Orchestra, under the direction of Howard Barlow, Monday evenings, over N.B.C.

Copyright, 1945, The Firestone Tire & Rubber Co.

FIRESTONE OFF-THE-HIGHWAY TIRES

Two tractors with taut winch lines eased this scraper over for field repairs in absence of lifting equipment

Scraper Turned Over for Field Repairs

WHEN Frank Mashuda's repair crew on his Mansfield, Ohio, airport grading job found they had to weld a broken bottom brace on a scraper, they just rolled the rig over on its side back of the field repair shop in the absence of a handy crane or other lifting device. The accompanying photo shows how it was done. Two tractors with winch lines were used, one on either side of the scraper (opposite tractor partly hidden in background). The lines were fastened to the frame on the side to be turned up, and the machine eased over, keeping both lines taut so that scraper came gently to rest on its side. Lines were hitched to the opposite side in flopping it back on its feet.

The LeTourneau service experts are not sure they recommend this procedure except when lifting equipment isn't available. Anyway they were non-committal, and described it as being rather unusual.

Broken bottom bar was welded at point shown, and also at front end after being straightened

Detroit Has Driver Training Program for City Employes

By GLENN C. RICHARDS

General Superintendent and Acting Commissioner, Detroit, Mich.

THE Detroit department of public works has conducted a drivers' school for municipal employes, which includes two phases of operations. The first phase, an 8-hour training period, was completed during the winter of 1943-1944. Following is an outline of its purpose, procedure and subjects covered:

Purpose: To acquaint D. P. W. truck drivers with their responsibilities while driving city-owned trucks, so that the department might function effectively as well as efficiently in performing its various duties. A sincere application of the trainee will result in a more thorough understanding of the critical value of equipment, departmental policies, safety factors and personnel relationships.

Trainee Assignment Procedure: A tentative number of 480 trainees were assigned by the D. P. W. at a rate of 15 trainees per 8-hr. day. The classes met in the Municipal Garage five days per week, Monday through Friday.

Facilities: Classroom equipped with 20 seats, blackboard, instructor's desk, and a collection of automotive parts broken while trucks were in service.

Materials: Films, paper, pencil, accident report blanks, departmental report blanks, and examinations.

Procedure: The 8-hr. training period is composed of classroom lectures, showing of films, and demonstrations as outlined in the classroom schedule. Recess periods, morning and afternoon.

Classroom Schedule: Includes registration, 8 to 9 A.M.; review of civil service and personnel policies, 9 to 10 A.M.; films 10:10 to 12 noon, also in this period a discussion of safety factors and handling of accident report forms;

The two films are:

"If It Happens" (20 min.), which suggests what you should do when accidents happen. Designed primarily for drivers of heavy trucks and other commercial vehicles, it affords many excellent suggestions for drivers of passenger cars as well.

"Open For Infection" (16 min.), featuring workman who cuts finger

TO KEEP OIL CLEANER, LONGER

WGB Clarofiers are adopted by manufacturers, specified for fleets. Leading builders of gas and Diesel engines install WGB Clarofiers as standard equipment . . . and countless cost-wise fleet operators have specified them for their vehicles. Check their three reasons. (1) They keep lubricating oil amber-clear for longer periods. (2) WGB replacement cartridges are inexpensive, and can easily be installed, without tools. (3) WGB Clarofiers are sturdy, simple, trouble-free—built for heavy-duty jobs. Specify WGB Oil Clarofiers for substantial savings in maintenance and operating costs.

Send for your free copy of book describing WGB oil clarofying at work in gas and Diesel engines.

WGB
OIL CLARIFIER, INC.
KINGSTON, N. Y.

LET'S KEEP SEDIMENT OUT OF LUBRICATION

and then scoffs at first-aid. Is ordered to first-aid room by foreman. While having the cut treated, he learns from the doctor of the great dangers in neglecting even the smallest cuts or injuries. The important reasons for prompt first-aid are given and examples of neglected first-aid are shown. The worker is firmly convinced by the argument and vows never again to let a cut go untreated.

After lunch, from 12:30 to 2 p.m., the program is on care of equipment as follows:

Daily motor and equipment check—Check motor oil, water, gasoline; check tire inflation; check reading on ammeter, temperature gauge and oil pressure gauge; check brakes before leaving the garage.

Proper handling of equipment—Riding clutch, clashing gears, brakes, examine display of damaged truck parts.

Then from 2 to 3:40 comes instruction on relationships with the public and fellow employes, then from 3:40 to 4:30 "exams" and general discussion.

New Program Late in 1944

The second phase started on November 1, 1944 and consisted of the following:

(1) **Tests:** Visual Acuity, Glare Acuity, Reaction Timing, Field of Vision, Distance Judgment.

(2) Behind-the-wheel demonstration and practice. The demonstration method will be used to show each driver what is considered good driving practice. After each demonstration the driver will be required to carry through each demonstration. If the driver is unable to successfully perform a certain operation, he will be given time to practice. All drivers will be required to attain a predetermined degree of efficiency before they are allowed to proceed to the next demonstration.

The demonstrations will be given on a driving range. The range is designed to duplicate conditions that are found in a normal day's work. Alleys, crosswalks, loading docks, street stop signs and street car tracks are laid out on a paved area 460 by 220 ft.

(3) Classroom instructions. Proper handling of equipment. Departmental policies. Traffic laws. Care of equipment (preventive maintenance).

New employes hired in as "Truck Drivers" are required to pass the various demonstrations. If the driver lacks some of the skills, he is given an opportunity to practice the maneuver until he proves he can pass them. A driver failing to come up to our standards, after a certain period of practice, is not allowed to handle equipment.

Street Signs in Havana

Street names in certain parts of Havana, Cuba, are carried on stone or concrete blocks of the type here shown. They are neat and durable, but to a visitor from this country seem to have more points against than for.

The blocks are set solidly on concrete bases in sidewalk or parking. Beside being at an elevation where any passing vehicle or pedestrian obscures them, the letters are too small and too much condensed to provide

Street Sign in Havana

easy reading for the passing motorist.

The cost of one of these blocks in place is probably less than that of a metal post and sign, but in the United States undoubtedly would exceed the cost of metal signs on a lamp post, wall or other structure. The ground space occupied by the blocks would almost certainly rule them out of congested areas. And finally, since most signs will of necessity be set higher, the lack of uniformity would be a draw-back.

▼

More Commercial Trucks for 1945—The War Production Board has scheduled for production in 1945 245,449 commercial trucks. In 1944 the number was 126,678. Largest increase will be in medium and light heavies.

TRANSITS and LEVELS
HEADQUARTERS for REPAIRS – any make

We will buy or trade in old Transits, Levels, Alidades, etc. Send instruments for valuation.

Write for new Catalogue RS-91 of Engineering Instruments, Engineering Field Equipment and Drafting Room Supplies.

WARREN-KNIGHT CO.
Mfrs. of Sterling Transits & Levels
136 N. 12th St., Philadelphia 7, Pa.

BUILT FOR Full loads Full days Full PROFITS

A Perfection Type 100 Series Dump Body and a Perfection 615, 715, 720 or 720-P Hydraulic Hoist make a unit that can be relied upon for continuous, low-cost, efficient service every day, the year through. Built for today's tough jobs—for outstanding workability and dependability—you get full capacity pay loads every trip.

Write for Bulletins and prices on Hydraulic Hoists—Steel Dump Bodies—Platform Stake Bodies—Steel Express Bodies—Public Utility Bodies—Public Service Bodies—Hand Hoist Dump Bodies—Gravity Dump Bodies.

ARMY E NAVY 4th CITATION FOR WAR PRODUCTION

THE PERFECTION STEEL BODY COMPANY :: GALION, OHIO

PERFECTION
TRUCK BODIES AND HOISTS

Welded for Strength & Service

WELLMAN
Williams BUCKETS

Welded Rolled Steel construction builds longer life and greater utility into Wellman buckets. Multiple Rope and Power Arm types. Dragline. Power Wheel. Special Service Buckets. ⅜ to 16½ yd. capacity.

Send for Bulletin

THE WELLMAN ENGINEERING CO.
7003 Central Avenue • Cleveland 4, Ohio
Sales and Service Agencies in Principal Cities

You need a "good right hand" to do the big, tough jobs! America's Post-War Construction will be that kind. The job will be BIG . . . the competition will be TOUGH!

Novo Equipment can serve as your "good right hand!" Novo Engines, Pumps, Hoists, and Generator-Sets are job-designed . . . factory-tested . . . and field-proven. They are built to do the job . . . do it efficiently and economically. Every piece of Novo Equipment is backed by more than 40 years of successful manufacturing!

Novo Equipment will fit your post-war construction plans like a glove . . . a WORK-GLOVE. It's designed, built, and priced for your "right hand".

There's a Novo Distributor in your vicinity. Contact him on your Equipment needs.

Send for Consolidated Catalogue #4-43 for full information about Novo's COMPLETE LINE of Construction Equipment.

Associate Member of A.E.D.

NOVO ENGINE CO.

LANSING 5, MICHIGAN

New Equipment and Materials

New Bituminous Supply Tank

A new type of bituminous supply tank that eliminates the use of a trailer frame has been developed by Littleford Bros., Inc., 454 E. Pearl St., Cincinnati 2, O. This supply tank has a self-supporting tank and is made in semi-trailer models. "Frameless" Construction is stated to give better load distribution and lower center of gravity. It is made in sizes ranging from 1,250 gal. to 4,000 gal. In addition to the "frameless" feature, the Littleford supply tanks are made in two types—Model No. 102 with vaporizing torch type burners and Model No. 103 with atomizing low pressure coilless burners. The prime use of the supply tank is for hauling bituminous materials from the source of supply to the pressure distributor on the job.

New "Frameless" Supply Tank

▼

New High Pressure Hose

A new flexible hose capable of carrying a stream of water powerful enough to rip the bark off a log has been brought out by United States Rubber Co., Rockefeller Center, New York, N. Y. The 1½ in. hose is braided with wire and specially fabricated to withstand high pressure. At present the hose is being used in debarking logs for paper and pulp mills. Attached to a debarking machine, developed by a Pacific coast pulp firm, the outfit is reported to have stripped a 20 ft. log in 30 seconds.

▼

New Compound for Mounting Synthetic Tubes

Recognizing that the mounting of synthetic inner tubes requires a different treatment than the mounting of inner tubes made of natural rubber, the Amalie Division of L. Sonneborn Sons, Inc., New York, has introduced a new product known as Amalie B. G. Compound specifically designed for use in mounting synthetic inner tubes. The new lubricant is a com-

meet SPECIAL NEEDS

ROGERS BROTHERS CORP.
ALBION, PENNA.

Bulky, cumbersome machinery, and of late heavy pieces of defense equipment must be moved from place to place.

In some localities, where low headroom is encountered, this type of Rogers Trailer is used extensively.

Large machines, with crawler treads "straddle" the girders thus lowering the overall height by several inches, a definite advantage also in handling many kinds of equipment.

ROGERS
TRAILERS

DIAMOND-BORED RODS
another "HIDDEN VALUE" in all WISCONSIN Air-Cooled ENGINES

Absolute uniformity and close-tolerance fit of all connecting rod bushings are direct results of the unique machine operation illustrated above. Each rod is rigidly locked in precisely the same position, and diamond-pointed bits machine both ends of every rod with uncanny smoothness and perfect mechanical precision. All of this helps to produce a quiet, smooth-running engine, designed and built for heavy-duty service all the way through.

All of this adds up to highly satisfactory end use on your equipment.

Most H.P. per pound
WISCONSIN MOTOR
Corporation
MILWAUKEE 14, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines

ETNYRE
"Black-Topper"
BITUMINOUS DISTRIBUTORS

Our headquarters for both

A. R. B. A. MEETING, JAN. 16-19

and the

A. E. D. MEETING, JAN. 21-24

will be at the

STEVENS HOTEL, CHICAGO

Stop in and see us!

E. D. ETNYRE & CO., Oregon, Illinois

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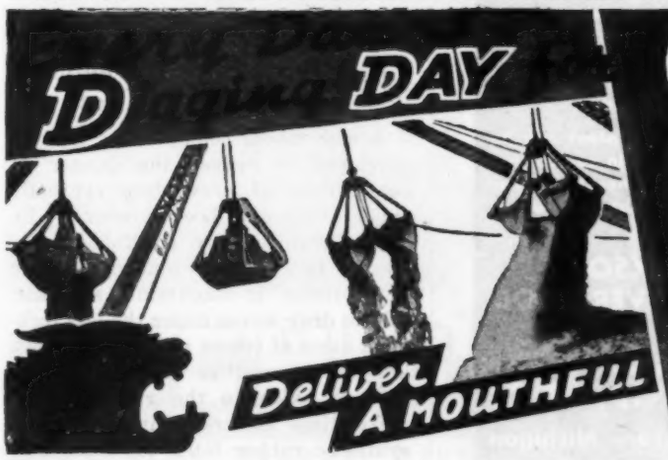


Deliver A MOUTHFUL

OWENS

AT EVERY BITE

THE OWEN BUCKET CO.
6070 Breakwater Ave. Cleveland, Ohio
Branches: NEW YORK, CHICAGO, PHILADELPHIA, BERKELEY, CAL.

for HIGHWAYS & AIRPORTS

The modern JACKSON Vibratory Paving Tube is the only full-width internal vibrator for highway and airport paving, backed by many years satisfactory use under widely varying conditions. Proved performance certifies to the contractor and engineer that they will get desired results in efficient and economical operation, placement, density, strength and wearing surface of the finished slab. This holds true for the usual mixes designed for vibratory placement and those made with air entraining cements.

The JACKSON Tube is super-powerful, with plenty of reserve beyond the toughest jobs encountered . . . is easily attached to any modern conventional finishing machine . . . available in 10 to 25 foot widths . . . simple, dependable with all "bugs" out.

Get up-to-date on vibratory placement of pavement concrete. Write today for new JACKSON folder.

JACKSON VIBRATORY PAVING TUBE

Standard, full-width, dual vibratory tubes submerged horizontally in concrete have proved most efficient through years of exhaustive tests and extensive use. Powerful high-frequency vibratory impulses are transmitted in force through the thickest slab, quickly transforming the stiffest mixes into uniformly workable condition. If desired, other types of vibratory elements can be easily substituted with the same basic frame and carriage.

The reserve capacity of the power plant can be used to run hand operated vibrators in conjunction with the tube. The power plant also generates power for electric tools and lights used on night clean-up or emergency operations.

THERE IS A RIGHT JACKSON CONCRETE VIBRATOR FOR EVERY JOB

MANUFACTURED FOR

JACKSON VIBRATORS, Inc.

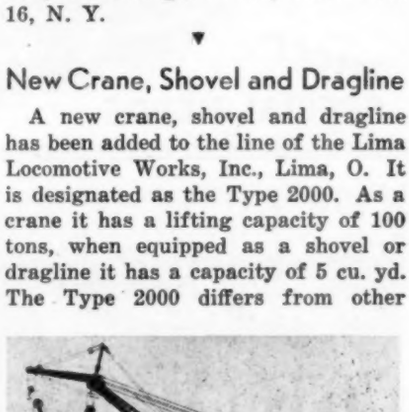
by ELECTRIC TAMPER & EQUIPMENT CO., Ludington, Michigan

pound of medium soft consistency made of pure vegetable oils and does not contain ingredients that are injurious or cause deterioration of synthetic or natural rubber. Detailed information, including step-by-step directions for the use of Amalie B. G. Compound, may be obtained by writing on your business stationery to the Amalie Division, L. Sonneborn Sons, Inc., 88 Lexington Ave., New York 16, N. Y.

▼

New Crane, Shovel and Dragline

A new crane, shovel and dragline has been added to the line of the Lima Locomotive Works, Inc., Lima, O. It is designated as the Type 2000. As a crane it has a lifting capacity of 100 tons, when equipped as a shovel or dragline it has a capacity of 5 cu. yd. The Type 2000 differs from other



Type 2000 Equipped for Special Crane Service Requiring a High Control Tower

Lima machines inasmuch as the drums are in tandem. It is equipped with air-control. The long wide crawlers effect low bearing pressure and maximum stability when working in, or traveling over wet and uneven ground. It is powered with either a Diesel or electric power unit and can be converted in the field from one combination to another without major dismantling. With the introduction of the Type 2000 the Lima line of shovels, cranes and draglines now ranges from ¾ cu. yd. to 5 cu. yd. All will be available as soon as government requirements are relaxed.

▼

New Process for Preventing Heat Failure of Tires

A new rubber compounding process developed to reduce the danger of heat-failure of heavy-duty synthetic rubber tires has been announced by The Firestone Tire & Rubber Co., Akron, O. The key material in the new process is magnesium sulphate, sold in drug stores under the less technical name of epsom salts. It has been known for sometime that the addition of zinc oxide to the rubber would make tires cooler-running. However synthetic rubber latex to which zinc

oxide had been added could not be made to coagulate or harden. The Firestone magnesium sulphate process now solves the difficulty and equal parts of latex and zinc oxide can be mixed together and coagulated easily and quickly.

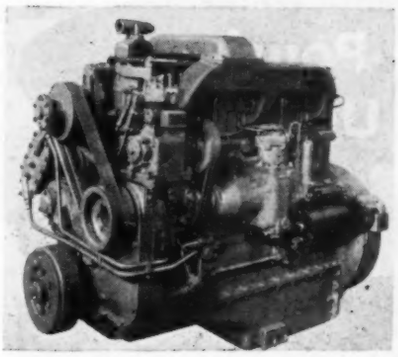
New High Speed Diesel Engines

The Cummins Engine Co., Inc., Columbus, Ind., has announced the development of a new series of engines, NH-600 and NHS-600. These are higher speed and higher horsepower versions of the Model H. introduced 13 years ago, and its supercharged counterpart, the Model HS. The increased output of these newly developed 6-cylinder engines is obtained by the following major innovations in established Cummins design:

(1) By increasing the maximum operating speed from 1,800 rpm. (Models H and HS) to 2,100 rpm. (Series NH and NHS).

(2) By increasing bore and stroke from 4⅞ in. x 6 in. (Models H and HS) to 5⅛ in. x 6 in. (Series NH and NHS), which increases piston displacement from 672 to 743 cu. in.

(3) Dual intake valves are employed to provide the increased air supply needed to assure efficient combustion of the additional fuel which the engine requires in order to produce increased horsepower. Dual exhaust valves permit the rapid exhausting of gases from the firing chamber.



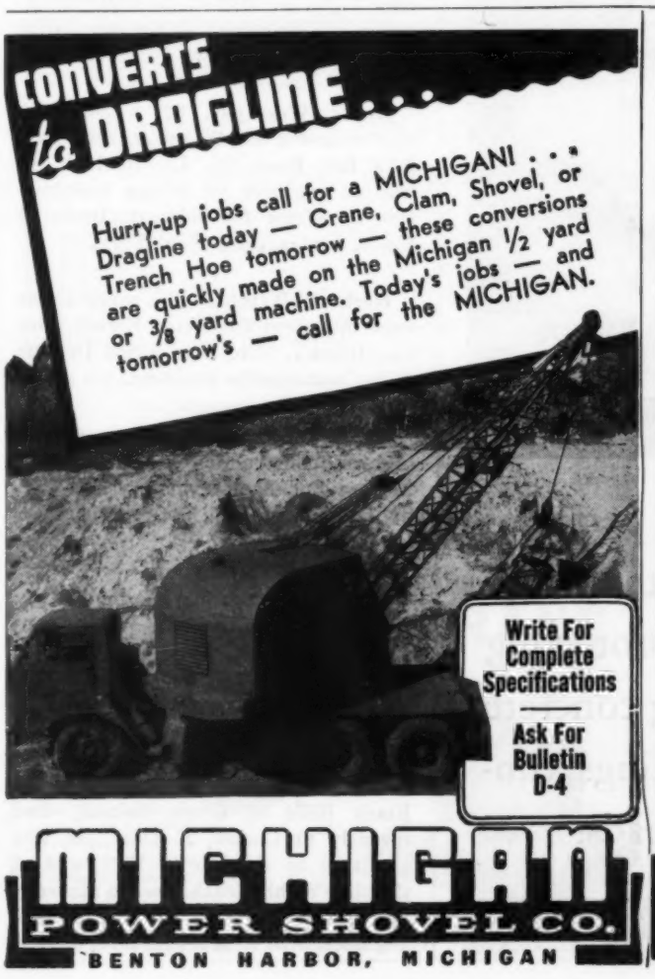
Series NHS-600 Cummins Diesel

Comparing the 200 hp. maximum output of the NH engine with the 150 hp. of the parent Model H, it can be seen that these improvements in design have produced 33⅓ per cent additional horsepower without appreciably increasing engine weight or dimensions. An even greater gain in horsepower (37½ per cent) is revealed by a comparison of the supercharged NHS engine with the supercharged Model HS, with 275 and 200 maximum horsepower output, respectively. Here, too, the increase has been obtained at very little cost in weight or size. In most respects other than those listed above, this new series of Cummins Deisels bears a marked resemblance to the H line.

An illustrated brochure containing complete specifications and engineering data on Series NH-600 and NHS-600 may be obtained by writing to Cummins Engine Co., Inc., Columbus, Ind., and asking for Bulletin 5206-1.

New Backfill Tamper

Smooth holding characteristics and the ease with which it can be "walked over the fill" are outstanding advantages claimed for a new backfill tamper recently introduced by Gardner-Denver Co., Quincy, Ill. The new tamper is stated to be an exceptionally well-balanced tool that will compact backfill to meet the most exacting requirements. According to operators it is not necessary to fight the tamper over the fill and this factor plus its easy holding characteristics permit them to work faster and more efficiently with less fatigue. Ruggedly designed and constructed, the tamper is powerful and fast and is extremely simple to maintain. There is no tendency toward freezing of the valve or the exhaust when operations are carried on in cold, damp weather.


CONVERTS
to DRAGLINE . . .
Hurry-up jobs call for a MICHIGAN! . . . Dragline today — Crane, Clam, Shovel, or Trench Hoe tomorrow — these conversions are quickly made on the Michigan ½ yard or ⅜ yard machine. Today's jobs — and tomorrow's — call for the MICHIGAN.
Write For Complete Specifications
Ask For Bulletin D-4
MICHIGAN
POWER SHOVEL CO.
BENTON HARBOR, MICHIGAN

TUTHILL HY-WAY GUARD
The Spring Cushions the Shock
Plan Now POST-WAR SAFETY
Include TUTHILL GUARD RAILS
PLANNING your Post-War Highway Safety Program logically includes specifying the TUTHILL GUARD RAIL. It prevents frequent accidents by being more plainly visible due to its convex surface. It saves lives and reduces damage. It deflects impacts—cushions shocks. Now available for complete installation, maintenance and repairs. Request details.
Pacific Coast Manufacturers and Distributors
U. S. SPRING & BUMPER CO., LOS ANGELES, CALIF.
TUTHILL SPRING COMPANY
761 POLK ST... CHICAGO 7, ILL.

When You're Pouring Concrete, Use . . .

SISALKRAFT

OVER THE SLAB . . . TO CURE AND PROTECT FROM DRIP AND DEBRIS

Waterproof, tear-resistant, scuff-proof SISALKRAFT retards evaporation and protects the concrete from dirt, dripping grout and debris.

ALL AROUND THE JOB FOR PROTECTION FROM FROST

Used all around the building, SISALKRAFT holds in the heat from salamanders or other heating units. On the large building job illustrated, the SISALKRAFT blankets are all in place, despite a gale that lasted 24 hrs.

For nearly 25 years the unmatched performance of SISALKRAFT has made it the Number One concrete curing and protecting agent. Use it when you're pouring concrete — for buildings, runways and roads.

THE SISALKRAFT CO.
205 W. WACKER DRIVE · CHICAGO 6, ILL.
NEW YORK · SAN FRANCISCO · LONDON · SYDNEY

Manufacturers of SISALKRAFT, FIBREEN, SISAL-X, SISALTAPE AND COPPER-ARMORED SISALKRAFT

Obituaries

Charles D. Vail, state highway engineer of Colorado for the past 14 years, died Jan. 8 in Denver, Colo. Mr. Vail was graduated from the University of Illinois in 1891. He went to Denver in 1908 and for the next 9 years was engaged in engineering work, namely for railroads and public utilities. In 1917 he was appointed manager of the Colorado Public Utilties Commission and six years later was made manager of improvements and parks for the city of Denver. In 1930 he was appointed state highway engineer and in the ensuing years the state's mileage of hard surfaced roads was increased from 539 to nearly 6,000.

Prof. George W. Pickels, 61, died suddenly last month. He had been connected with the Department of Civil Engineering of the University of Illinois since 1907.

Corydon T. Purdy, 85, chairman of the board and former president of Purdy & Henderson Co., engineers, New York, and one of the early developers of the steel skyscraper, died Dec. 25 in Melbourne, Fla.

Henry Westdyke, 62, a construction engineer for 25 years, died Jan. 5 in Red Bank, N. J. His last job was as engineer on bridge construction in Africa for Johnson, Drake & Piper, contractors, New York.

Herbert Wright, 40, construction superintendent for Peter Kiewit Sons Co., Omaha, Neb., was killed Dec. 26 in an automobile accident.

Harry B. Franciscus, 73, a former highway construction engineer for the Moreno-Buckham Construction Co., St. Louis, Mo., died last month in St. Louis, Mo.

R. L. Rowland, 57, head of R. L. Rowland, Inc., Tacoma, Wash., contractor, died Dec. 21 in Tacoma. He had been engaged in the construction business for over 30 years.

Scovel Johnson, 67, designer and builder of the Needles highway in the Black Hills of South Dakota, died recently at Custer, S. Dak. He was admitted to the bar in 1927, and at the time of his death was an attorney for the Burlington Rd. and a civil engineer with licenses in three states.

When in need of heavy machinery trailer information

——*Write*——

La Crosse Trailer & Equipment Company

LA CROSSE - - - WISCONSIN

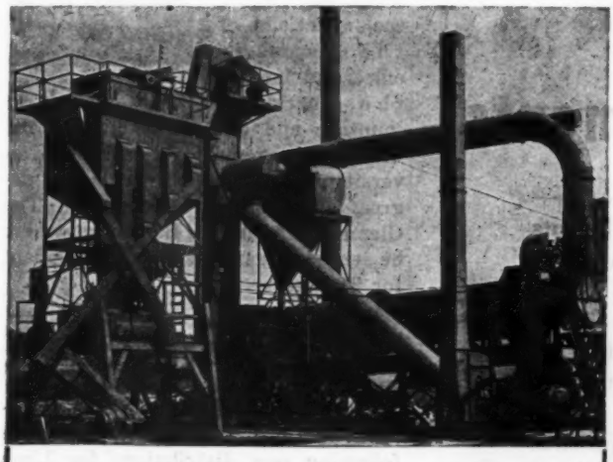
Three semi trailers shipped recently to one of our southern dealers:

Left—DF6 18-semi.
Center—DF6T 18-semi.
Right—DF4 11-semi.

These are all very popular models.

Remember the name—

LA CROSSE



INCREASED EFFICIENCY AND PRODUCTION IN *Asphalt Mixing*

A larger fan, new horizontal cyclone dust collector, and new duct system are among the refinements that make this H & B portable plant even more compact and efficient. Exhaust fan, motor which drives the dryer, and speed reducer are combined in one completely assembled unit, mounted on a separate platform. A new type of screen reduces overall height—without reducing bin capacity. Write for complete information.

HETHERINGTON & BERNER INC.
721 Kentucky Ave., Indianapolis 7, Ind.

It Opens — and Dumps

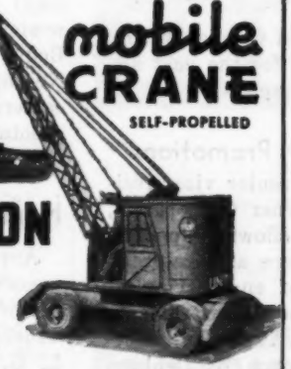
The New Enclosed Type Container for Brooks Load Lugger

Write for Bulletin No. 44-A and get full details of this handy outfit. For handling garbage, refuse and waste...wet or dry. Hoisting unit fits on standard chassis. Mechanically operated with power take-off from truck motor. One-man control. Time-saver for municipalities or public buildings for refuse disposal.

501 DAVENPORT ROAD, KNOXVILLE 8, TENN.
Distributors in all Principal Cities

Brooks EQUIPMENT & MFG. CO. KNOXVILLE TENNESSEE

UNIT 5 TON mobile CRANE
SELF-PROPELLED



Powerful, fast-stepping Mobile Crane . . . one-man operated . . . for "on and off" highway operations . . . simple to operate . . . (eliminates cut-up terrain, mutilated concrete docks and runways.)

Write for particulars.

UNIT CRANE & SHOVEL *Corp.* MILWAUKEE 14 WISCONSIN

½ *Cu. Yd.* — 8' *Lift*

FRONT END LOADERS
for Industrial Tractors
Write for Catalog

Elkhart **White Mfg. Co.** Indiana

Interchangeable Attachments

Insley Type K Excavators—both the ⅜ and ½-yd. models—are designed to handle six readily interchangeable attachments . . . shovel . . . trench hoe . . . basement hoe . . . crane . . . clamshell . . . dragline.

With any one of these attachments, the basic features of Insley Excavator design assure you of maximum mobility . . . easy maneuverability . . . low-cost yardage in the tightest spots or the toughest terrain.

Inquire now about an Insley Excavator for your postwar dirt or rock moving and material handling jobs. Be ready to specify INSLEY when conditions again permit production for peacetime needs.

INSLEY MANUFACTURING CORP., INDIANAPOLIS 1, IND.

Research Appointments by Universal Atlas

The appointment of D. I. Elder as Research Consultant, Universal Atlas Cement Co., at Buffington, Ind., and of Dr. W. C. Hansen as manager research laboratories, at Buffington, has been announced by G. L. Lindsay, Director of Tests and Research, New York. Mr. Elder started with the company as a chemist in 1925 at the Buffington plant, and has since held the positions of Research Chemist and Research Manager. Dr. Hansen comes to the company from the Portland Cement Association in Chicago where he has been engaged for the past six years in a research capacity.

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Stewart-Warner Promotions

Frank A. Hitter, senior vice-president of Stewart-Warner Corporation, has announced the following appointments: Arden LeFevre as vice-president and director of engineering of Division One (alemite, instruments and radio); Fred R. Cross, as advertising manager; George W. Oehlsen, Jr., as assistant director of engineering, Division One.

With the Manufacturers

Thew Shovel Appoints New Official

Waid V. Clark has been appointed controller of The Thew Shovel Co., Lorain, O. This newly-created office has been established in anticipation of increased postwar work that will come under the supervision of the controller's office and include the general accounting and cost departments. Mr. Clark is a graduate of Cornell University where he received his law degree, and came to Thew from The Glenn L. Martin Co., Baltimore, where he served as assistant to the president for 2½ years.

W. V. Clark

▼

Eight New Distributors for Lima

Lima Locomotive Works, Incorporated, Lima, O., has appointed the following new distributors for Lima shovels, draglines and cranes: Held-McCoy Machinery Co., 3201 Brighton Blvd., Denver 5, Colo. Territory: State of Colorado. Contractors' Equipment and Supply Co. with offices at Springer Bldg., Albuquerque, N. M., and Stanton St., El Paso, Tex. Territory: New Mexico and western Texas. Interstate Machinery and Supply Co., 1006-10 Douglas St., Omaha 2, Neb. Territory: State of Nebraska and western Iowa. Waterloo Construction Co., 524 Park Road, Waterloo, Ia. Territory: Eastern Iowa. Phillippi-Murphy Equipment Co., 360 Hoover St., N. E., Minneapolis 13, Minn. Territory: Part of Minnesota and northwestern Wisconsin. Smith Commercial Body Works, Inc., 1620 First Ave., North, Fargo, N. D. Territory: Northeastern Montana, northwestern Minnesota and the state of North Dakota.

▼

Name Savacool to Mack Board

Appointment of J. E. Savacool, vice president and comptroller, as a member of the board of directors of Mack Trucks, Inc., has been announced by L. G. Bissell, board chairman. Mr. Savacool joined Mack in 1913 as an accountant in the Chicago Branch.

N. W. Gregg Becomes Public Relations Director of A.R.B.A.

Norman W. Gregg, Chicago newspaper man and publicist, has joined the American Road Builders' Association, Washington, D. C., as Director of Public Relations. He comes to the ARBA from Advertising Producers-Associated, Chicago, where he had been Director of Publicity for the past three years. Mr. Gregg was Director of Publicity for Erwin, Wasey & Company, Ltd., Chicago, from 1927 to 1937. During this time he organized the promotion department of "A Century of Progress" while on a leave of absence. Other connections include McCutcheon-Gerson Service and Inter-Ocean Syndicate. He has a background of editorial work on Middle Western newspapers, among them The Chicago Tribune and the Chicago Herald & Examiner. The new director takes over his duties on the eve of the 42nd annual ARBA convention, Stevens Hotel, Chicago, Jan. 16-19.

N. W. Gregg

▼

Four New Distributors For Marion

The Marion Steam Shovel Co., Marion, O., has added to its list of distributors the following companies: Tulsa Equipment Co., 317 East Third St., Tulsa, Okla., representing the state of Oklahoma. Texas Equipment Co., Houston, Tex., Marion distributor for southwestern Texas. Shaw Sales and Service Co., 2027 South Santa Fe Ave., Los Angeles, Calif., will represent Marion power shovels in southern California. Shaffer & Co., Brazil, Ind., will represent the Marion line in southern Indiana and western Kentucky.

▼

Paul J. Wolfert New Export Engineer for Blaw-Knox

Paul J. Wolfert, assistant to the manager of construction equipment of the Blaw-Knox Division of the Blaw-Knox Co., has been promoted to export department engineer. He took up his new duties in New York on Jan. 2, and will assist H. T. Schwier, export manager. Mr. Wolfert will be engaged in the promotion and sale of all the various Blaw-Knox products for the export trade.

"The winner of this war will be the side that moves the greatest amount of dirt in the shortest possible time"

That statement, by a high-ranking officer in the South Pacific area, is graphic proof of the wartime importance of excavating machinery.

Moving dirt—or rock, sand, mud, gravel, shale, coal, coral, snow and ore—fast and efficiently, is a specialty of General-built equipment. And these excavating machines have the built-in stamina, power and adaptability to "go the distance in any kind of going."

You can see the evidence today on a global scale, all as a part of one big job . . . winning this war.

"That goes for the winners of Post-Victory Business, too."

"Civilian Generals," Excavators and Supercranes with long outstanding records, are busier than ever here at home. This performance, and that of their counterparts overseas, has contributed to the blueprints for the all-purpose revolutionary Machine of Tomorrow—

THE GENERAL TYPE 10

WRITE TODAY TO BE READY FOR RECONVERSION DAY!

THE OSGOOD COMPANY — SHOVELS, DRAGLINES, CRANES — CRAWLER & WHEEL MOUNTS — DIESEL, OIL, GAS, ELECTRIC

Associated with The Osgood Company

GENERAL EXCAVATOR CO. — MARION, OHIO

GENERAL — CRANES, DRAGLINES AND SHOVELS — DIESEL, GAS, ELECTRIC

ERIE THE COMPLETE LINE **BUCKETS**

Hundreds of Erie Buckets are being shipped monthly for war uses. Straight line bucket production experience means better buckets for post-war and fast delivery. Investigate the complete Erie line now.

ERIE STEEL CONSTRUCTION CO · ERIE, PA.

AggreMeters · Buckets · Concrete Plants · Traveling Cranes

Twenty-two REASONS
Why *FLEX-PLANE* Dummy Joints are Necessary in Modern Concrete Pavements

- Reduces the Number of Expansion Joints
- More Dummy Joints Divide Contraction Openings
- Prevents Cracking
- Retards Creeping
- Controls Warping
- Reduces Curling
- Relieves Stress
- Lessens Bumps
- Minimizes Pumping
- Minimizes Panning
- Lessens Deterioration
- Lowest Cost
- Limits Maintenance Cost
- Anchored in Place—Is Permanent
- No Extrusion
- Localizes Expansion and Contraction
- Assists in Normalizing the Slabs
- Ribbon Joint is Continuous in Length
- Prevents Infiltration of Water
- Increases Strength of Slabs
- Produces Homogenous Structure
- Provides Expansion Relief for the Hot Upper Part of the Slab

FLEX-PLANE joint installing machines eliminate messy hand methods. Install all types of joints . . . ribbon, poured, premoulded, etc., with or without VIBRATION.

• *Ask for Equipment Specifications* •

FLEXIBLE ROAD JOINT MACHINE CO. WARREN, OHIO U. S. A.

PARA-PLASTIC
Hot-Poured "Miracle Seal"

Manufactured by SERVICISED to conform to Federal Spec. SS-F-336 and C.A.A. Spec. P-605, *Para-Plastic* is recognized in the construction engineering field as a positive water seal for concrete and general construction.

Pioneers in the manufacture of Approved Construction Materials for over twenty-five years.

SERVICISED PRODUCTS CORPORATION
6051 West 65th Street Chicago 38, Ill.

Charles A. Cook Joins Wisconsin Axle

B. W. Keese, Chief Engineer of the Wisconsin Axle Division of The Timken-Detroit Axle Co., has announced the appointment of Charles A. Cook as his assistant in charge of transmission design. Active in automotive engineering work since 1913, Mr. Cook has been with the Fuller Manufacturing Co. for the past 16 years, and since 1934 has been chief engineer and executive engineer in charge of product design, tool design, metallurgical and experimental departments. In his new post Cook will have charge of Wisconsin Axle's program of transmission development for postwar commercial vehicles.

C. A. Cook

M. T. Farley Heads Parts Depot Program of Caterpillar

Merwin T. Farley has been appointed supervisor of parts depots of Caterpillar Tractor Co., Peoria, Ill. Mr. Farley has been associated with "Caterpillar" and its predecessor companies since 1914, first with The Holt Manufacturing Co. at Stockton, Calif. Mr. Farley's responsibility for parts processing has been assigned to D. M. Gilbert, General Superintendent of Parts, and Harold H. Bosecker has been advanced to Superintendent of Parts Processing.

J. E. Boudreau New Advertising Manager of Ethyl

Rejoining Ethyl Corporation, New York, N. Y., after his release from duty with the Sixth Service Command, Lt. Col. James E. Boudreau has been appointed advertising manager with headquarters in New York. As advertising manager he will be a member of the staff of Ralph C. Champlin, director of advertising and public relations.

Graham-Paige to Manufacture Rototiller

Graham-Paige Motors Corp., Detroit, Mich., has acquired from Rototiller Inc., Troy, N. Y., license rights to manufacture and sell rototillers, including walking and riding, road-making and heavy duty types. Rototiller Inc. will continue to build a small wheelbarrow type model and various attachments.

J. F. Sims Appointed General Sales Manager

J. Frank Sims has been appointed general sales manager of Contractors Machinery Co., Inc., Batavia, N. Y., manufacturers of Trojan road equipment, and will be in charge of all sales activities through dealers' organizations. Mr. Sims, before his association with Contractors Machinery Co., spent several years on construction equipment during the reconstruction of the Mississippi River Levee System following the floods of 1927. He joined International Harvester Co. in 1934 and served as District representative in the Southern, Central and Eastern Districts. In January, 1942, he was assigned to Harvester's Washington Office where he handled the Industrial Power Equipment with the Army, Navy, Marine Corps and War Production Board. Mr. Sims was made Zone Manager when International Harvester Co. created the new Industrial Power Equipment Division, with Headquarters in Richmond, Va., which position he held until joining Contractors Machinery Co.

J. F. Sims

▼

Timken Dioramic Display Employs Motion in Three Elements

The first dioramic display, the first to employ motion in three elements—on land, sea, and in the air—has been built by The Timken Roller Bearing Co., Canton, O., for the Museum of Science and Industry in Rockefeller Center, New York. Designed and constructed by Messmore & Damon, specialists of New York City, the display shows a landing scene on the Normandy coast. In the immediate foreground, a row of tanks, guns and armored vehicles travel from right to left across the beachhead, while more streams of mechanized equipment pour from the ramps of three LST boats offshore. All vehicles are built to scale and are authentic reproductions especially built for the display. A brief message covering the four principle contributions of the Timken Co. to the war effort are shown in the translite panels on each side of the landing scene. These cover Timken bearings, Timken steel and seamless steel tubing, Timken rock bits, and the Timken method of manufacturing gun tubes. Small panels containing bearings are built into the main section of the display on each side.

"My fleet of Hercules Dumps has had a real workout the past few years, but every job has come through with colors flying.

It's really surprising how seldom Hercules bodies need service or repairs, and when they do, my Hercules distributor is right on the job.

My drivers like Hercules Hydraulic Hoists because of their ample reserve power, their dependability, and their "button-ease" dash controls, with no levers in the cab.

That Hercules slogan, "Men like to say they use them", certainly applies to me!"

Write us, or see the nearest Hercules Distributor regarding the Dump Bodies or Hoists you need now.

HERCULES STEEL PRODUCTS COMPANY
GALION, OHIO

ARMY E NAVY

Aeroil TRADE MARK REG.

employees and management are honored to announce that the Army-Navy "E" Award for excellence in war production was made on Thursday, December twenty-eighth, nineteen hundred and forty-four.

AEROIL BURNER COMPANY, INC.
West New York, N. J.
CHICAGO SAN FRANCISCO DALLAS

South Bend
GUTTER-SNIPE
PICK-UP STREET SWEEPERS

STREET FLUSHERS
STREET SPRINKLERS
BITUMINOUS DISTRIBUTORS
BITUMINOUS MAINTENANCE UNITS

Since 1908

MUNICIPAL SUPPLY COMPANY - SOUTH BEND 23, INDIANA

Clearing House

WANTED
National
DISTRIBUTOR
by old established
PNEUMATIC TOOL CO.

Manufacturer of Quality Pneumatic tools, established for over fifty years is planning its post-war distribution of entire line of forged tools for the construction trade.

They seek an organization — with established contacts in this field — which has adequate financial backing to take over distribution for the entire United States.

Address your reply to
P. O. Box 1562
Pittsburgh 30, Penna.

WANTED TO BUY
Low semi-trailer, standard make, with tandem axle with not less than twelve wheels, minimum capacity 20 tons—25 preferred.

Diamond Engineering Company
700 South Monroe Street
Grand Island, Nebraska

WANTED: Experienced Contractor on stabilized base construction and asphalt surface treatments. Must own complete equipment. For work in Colombia, South America. Guaranteed a minimum contract of 500,000 square yards. First class references required. Apartado 415, Cali, Colombia. Box 700, Roads & Streets 330 South Wells Street, Chicago 6, Ill.

FOR SALE: One Autocar Tractor-Truk, C90 3 ton with Rogers Low-bed Trailer, both in A-1 shape.

E. G. BOWLES, Contractor
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New Barber-Greene Sales Organization in Wisconsin

Barber-Greene Co., Aurora, Ill., manufacturers of asphalt paving equipment and material handling machines has announced the appointment of several new representatives in Wisconsin by both Industrial as well as Construction Divisions. The Barber-Greene office in Milwaukee has been replaced by this new organization. L. A. Larson, formerly District Manager out of Milwaukee, has been promoted to Area Manager for Barber-Greene's Area No. 6 which includes Wisconsin, Minnesota, North Dakota, South Dakota, Montana, Wyoming, Nebraska, Iowa and a section of Northwestern Illinois. Mr. Larson will headquarter in Minneapolis. The new distributors for Barber-Greene are: Northeast Wisconsin and Upper Michigan — The Brebner-Sinz Machinery Co., Inc., 1744 South Broadway, Green Bay, Wis., and branch office at 5 and Spring Sts., Marquette, Mich. Construction and Industrial Division. Southeast Wisconsin — The Milwaukee Power Equipment Co., 525 North 22nd St., Milwaukee 3, Wis. Industrial Division only. Southeast Wisconsin—The Stone Mfg. Co., 321 North 25th St., Milwaukee, Wis. Construction Division only. Southwestern Wisconsin—Miller, Bradford and Risberg Co. of Eau Claire in Southwestern Wisconsin, on Construction and Industrial. Northwest Wisconsin —Miller, Bradford and Risberg Co. will handle Construction Division only. Northwest Wisconsin—Wm. H. Ziegler Co. Industrial Division only. Southeast Iowa and seven Illinois counties adjacent to Davenport—Gierke-Robinson Co., Davenport, Ia. Construction and Industrial Divisions. Central and Northeastern Iowa — Gibbs-Cook Equipment Co., Des Moines, Ia. Construction and Industrial Divisions.

▼

Promotions in Sales Organization of Standard Oil of Indiana

Completing 48 years of service with Standard Oil Co. (Indiana), Amos Ball, vice president in charge of sales and a director long prominent and widely known in the petroleum industry, retired Jan. 1, 1945. Mr. Ball's retirement precipitates a long train of promotions in the sales managerial organization of the company. Roy F. McConnell, now general manager of sales, will move into the vice presidency, and H. E. Hanson, now ranking assistant general manager, will become the general manager of sales. R. F. Baity, assistant general manager for the central division, will take Mr. Hanson's place. J. W. Honomichl, now manager of the company's Des Moines, Ia., sales division, will come to Chicago as an assistant general manager of sales for the central division. His place will be filled by R. T. Kinneman, now manager at La Crosse, Wis. D. J. Byers, assistant manager at St. Louis, Mo., will be promoted to manager at La Crosse, and H. L. Poole, a sales promoter on the general office staff, will go to St. Louis as an assistant manager. In connection with the changes the title of L. C. Welch, will be changed from that of manager to general manager lubricating and sales technical service departments.

▼

New Pioneer Distributor

The Martin-Roasa Tractor & Equipment Co., Cedar Rapids, Ia., has been appointed distributor for Pioneer Engineering Works, Minneapolis, Minn., and will represent the company in the distribution of Pioneer crushers, feeders, screens, Duplex gravel plants, washing plants, belt conveyors and bituminous mixing plants. The new Pioneer distributor will continue to handle Caterpillar tractors, Lorain shovels and a full line of equipment for construction purposes. They maintain a branch in Hannibal, Mo., and will serve several counties in northeast Missouri as well as eastern Iowa.

M-R-S to Double Its Production

The M-R-S Manufacturing Co., Jackson, Miss, producers of Mississippi wagon hauling units, plans to increase its production in 1945, according to an announcement by L. R. Simmons, general manager. The present plans call for double production of Mississippi Wagons during the coming year as compared to our 1944 production. This increase in output is being made due to increased demands for this type of hauling equipment. During the past year, fleets of Mississippi wagons have been sold throughout the United States and in foreign countries. Presently, Mississippi Wagons are being produced in three sizes: Model 75, 10.5 yd. heaped capacity with standard sideboards; Model 85, 10.5 yd. heaped capacity; and Model 120, 15 yd. heaped capacity. The unit is powered with a M-R-S Special International Harvester Diesel wheel tractor. It has a hydraulic transferring device between the tractor and trailer, preventing unnecessary hardships on the tractor during the fast part of the haul, yet providing extra weight for traction when traction is needed in rough going. The sales organization of M-R-S Manufacturing Co. is headed by C. H. King, general sales manager.

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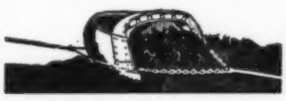
With Sauerman Scrapers

Explanation of Picture

Above is a ½ cu. yd. Sauerman Scraper hauling gravel out of a wide pit to a crusher that feeds a portable screening plant on a road project. Consumes about 3 gal. of gasoline hourly to dig and haul 30 cu. yd. of gravel.



Crescent Scraper Bucket

Exclusive feature of Sauerman Scraper Machines is the Crescent bottomless bucket which handles large loads faster and with less line-pull than any other scraper.

THOUSANDS of engineers and contractors have found that Sauerman Scraper Machines make easy work of many material handling problems that would be costly by any other method.

Digging, hauling and automatic dumping are merged into a continuous operation controlled by one operator. Power requirement is moderate. Maintenance is simple.

Sauerman machines offer handling capacities from 10 to 600 cu. yd. per hour and operating spans from 200 to 1500 ft. Specifications of the various sizes and types of machines, together with illustrations of their uses are given in the Sauerman catalogs. Write for this literature today.

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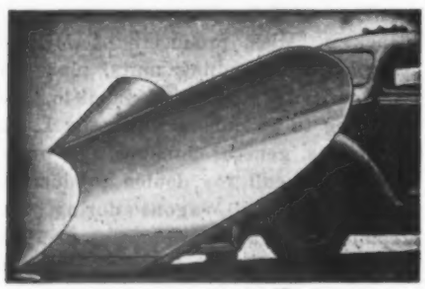

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Write for Bulletin

ROOT SPRING SCRAPER CO.
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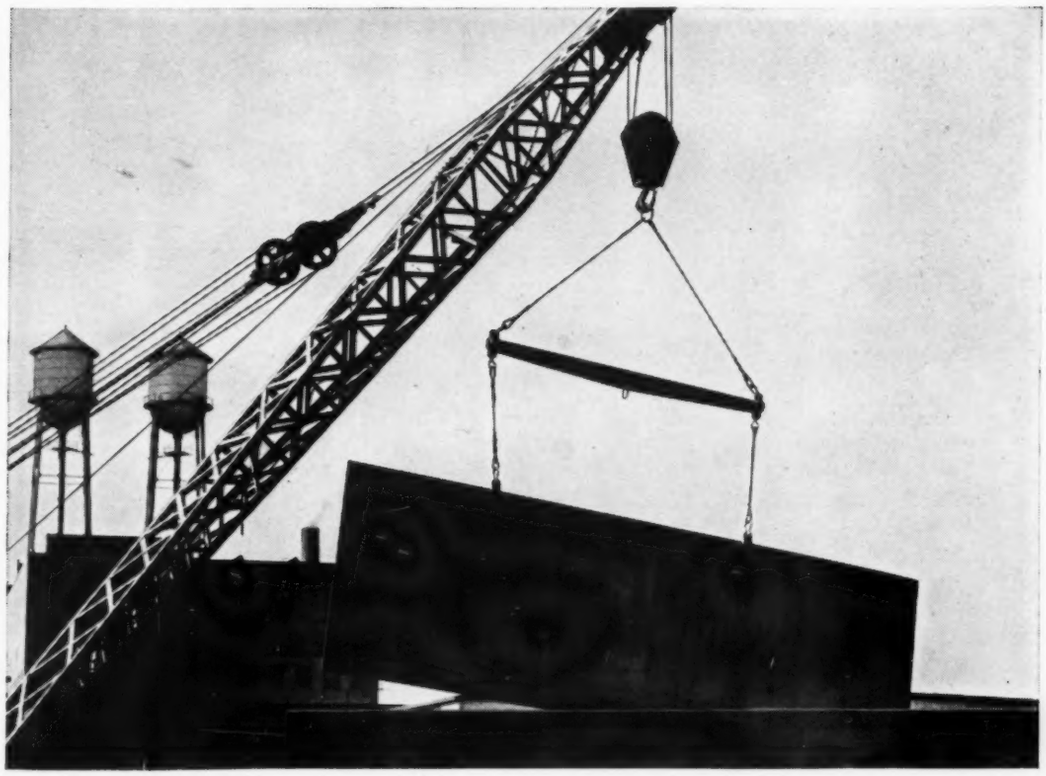
for the Everyday Jobs ahead...



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